

Acc. No. 100
Date
Price
The Journal of the
JAIPUR
American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 110 No 1

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CHICAGO ILLINOIS

JANUARY 1 1938

THE EMPLOYEE WITH HEART DISEASE

HIS MANAGEMENT IN INDUSTRY

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In dealing with the problem of heart disease in industry, the physician is faced with two important questions

1 What types of heart disease are compatible with employment in industry?

2 What can be done to conserve the usefulness of employees with heart disease and to minimize compensation costs to the employer?

In an attempt to throw light on these questions, we shall review our experience of more than seven years with heart disease in a group of employees of the Eastman Kodak Company

The first general physical examination of the employees was made in 1914. In 1922 another physical examination was made of the 3,280 employees of three plants. Both examinations showed a considerable number of cases of organic heart disease. In 1914 the rate of incidence was not determined. In 1922 the incidence was found to be approximately 4 per cent. In 1930 600 employees of one of the plants were examined. At that time all cardiac abnormalities, however slight, were considered in determining the rate of incidence, which was found to be 6.5 per cent.

The employees with heart disease discovered in the 1914 examination were periodically reexamined but, owing to a limited medical personnel, not as frequently as was desirable. The survey of 1922 was followed up somewhat more systematically. Nevertheless, an employee with heart disease who had not been followed closely enough would not infrequently be found to have symptoms of beginning failure or extremely high blood pressure.

In December 1929 we put in operation a plan which had for its purposes

1 To establish criteria for the acceptance or rejection of applicants for employment found to have cardiovascular abnormalities

2 To avert or postpone cardiac failure and to avoid possible attendant compensation costs, by closer supervision of such employees, by job placement, and by cooperation with family physicians

3 To conduct a long term study of heart disease in industry

It was decided at the outset to adopt with slight modification the criteria for the classification and diagnosis of heart disease prepared by the Heart Committee of the New York Tuberculosis and Health Association and approved by the American Heart Association

SOURCE OF CASES

For the purposes of the study the following employees were chosen

1 The employees with cardiac abnormalities discovered in the examinations of 1914, 1922 and 1930. These employees received first consideration in the present study. A number of them had been observed continuously since 1914.

2 New employees passed with compensated cardiac conditions

3 Additional cases of heart disease discovered in the examination of (a) employees returning from sick leave, (b) employees reporting to the medical department with various complaints, and (c) special groups e.g., executives, employees exposed to occupational hazards, and food handlers

4 Employees with cardiac abnormalities discovered by means of roentgenograms taken at a distance of 6 feet. These roentgenograms, as a matter of routine, are taken of all applicants and, at intervals of three years or less, of all employees

EXAMINATION OF EMPLOYEES WITH HEART DISEASE

About three fourths of the cases of organic disease reported were recorded on the standard heart charts of the New York Tuberculosis and Health Association.¹ These charts minimize the chance of omitting important data and are well adapted to statistical treatment. The examination includes a Wassermann test of the blood, complete analysis of the urine, and blood count if indicated. A teleoroentgenogram and electrocardiogram are taken in each case. The majority of the group with organic disease have had two or more electrocardiograms.

The visiting nursing service of the company, which is of a medicosocial character, is utilized to ascertain facts about the home environment of employees with cardiac conditions.

PROCEDURE IN FOLLOW-UP

All cases of organic heart disease and also "possible" and "potential" cases are cross-indexed and filed according to etiologic diagnosis. The intervals between examinations are usually from six months to one year. Some employees are seen every three or four months or oftener, depending on the urgency of their condition. Lack of intelligence or failure to cooperate may be factors making for greater frequency of examination.

1 Criteria for the Classification and Diagnosis of Heart Disease
ed 3 New York New York Tuberculosis and Health Association 1932

From the Medical Department Eastman Kodak Company.
Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Eighth Annual Session of the American Medical Association Atlantic City, N. J. June 11, 1937.

CRITERIA FOR EMPLOYMENT AND PLACEMENT OF PERSONS WITH CARDIAC ABNORMALITIES

The practice of discriminating according to fixed criteria in the selection and placement of employees with heart disease is a recent innovation in industry.

In a comprehensive article written in 1927, describing the attitude of certain industries in Chicago at that time toward the employment of persons with cardiac disease, Mock and Moore² made this statement: "Of thirty-four industries tabulated, only twenty-seven have a well defined policy in connection with their employment. Nearly half of these reject all, eight will hire the well compensated case, and two others make exceptions for highly skilled workers in positions which are hard to fill."

In 1933 Davis³ pointed out the danger and uncertainty attendant on the employment of persons with syphilitic or hypertensive and arteriosclerotic heart disease and rightly advocated intensive studies of these groups with a view to establishing criteria for their placement and management in industry.

The criteria which follow (revised as of June 1, 1934) have been used by the medical examiners for approximately five years. The suggestions of Dr. Cassius Watson, medical director of the American Telephone and Telegraph Company, were helpful in the formulation of these criteria.

I. Reject

A. History

- 1 Syphilis (postpone rating for result of Wassermann test taken by examiner and recheck physical findings)
- 2 Recent hyperthyroidism
- 3 Recent carditis or acute infectious diseases apt to involve the heart, rheumatic fever within three years, tonsillitis (recent or recurrent attacks)
- 4 Cardiac failure, recent or past

B. Physical examination (to be made in every case regardless of history). In passing on an applicant with cardiac abnormality, the age, nervous stability, general physical condition, probability of cooperation and suitability for the job specified are to be given careful consideration. In the presence of signs or symptoms of organic heart disease—further study required—the patient must have an electrocardiogram and a 6 foot plate of the heart.

- 1 Signs of decompensation
- 2 Foci of infection, tonsils (infected) and teeth (several carious) not removed
- 3 Aortic lesions
- 4 Congenital heart disease
- 5 Coronary artery disease
- 6 Hypertensive heart disease or essential hypertension, with persistent systolic blood pressure of 150 or more or diastolic pressure over 100, in adults up to 40 years of age after complete horizontal rest for ten minutes
- 7 Hypertension, systolic pressure of 95 or less after complete horizontal rest for ten minutes (seldom passed)
- 8 Positive Wassermann reaction or other stigmas of syphilis
- 9 Arrhythmias
 - (a) Auricular fibrillation
 - (b) Paroxysmal tachycardia
 - (c) Pulsus alternans

II. Accept

A. Rheumatic heart disease (inactive) or heart disease of unknown cause. Applicants showing mitral insufficiency, stenosis or moderate hypertrophy, with good

compensation and without much enlargement, with no signs of aortic lesions, are acceptable. However, each applicant should receive individual study and be classified accordingly. Applicants are accepted when there is

- 1 No history of recent or recurrent sore throat
 - 2 No history of decompensation
 - 3 No history of rheumatic fever within three years
- B. Hypertensive heart disease or essential hypertension (without signs of renal involvement) or with moderate cardiac enlargement and blood pressure not over the limit specified under Reject B 6
- C. Arrhythmias. Applicants with simple premature contractions or extrasystoles not associated with organic heart disease may be passed
- D. Simple tachycardia. Applicants are passed in the absence of endocrine dyscrasia or the absence of organic heart lesion. No fixed pulse rate is specified, but due regard is to be given to the applicant's general health and nervous balance and the effect on the rate of horizontal rest for fifteen minutes.

All applicants giving evidence of cardiac or circulatory disorders should have routine readings of the blood pressure, examination of the urine, a Wassermann test of the blood and a 6 foot plate of the heart at the time of the initial examination. Rejected applicants, after removal of possible foci of infection, such as carious teeth and diseased tonsils, may be reconsidered.

All persons with heart disease accepted for employment are placed in a special group and cross indexed for follow-up at regular intervals. The work assigned these employees cannot be changed without the approval of the medical department.

The medical department is furnished at the time of the examinations with a brief description or analysis of every job for which applicants are hired. The employment manager is consulted regarding any questionable adjustment and, if necessary, an inspection of the job is made by the medical examiner.

Up to the present time no person accepted for employment with adherence to the criteria outlined has shown signs of failure.

The employees under our observation are divided into two main groups—those with organic heart disease and those with possible or potential heart disease.

ORGANIC HEART DISEASE 278 CASES

Although we have made a diagnosis in each case under four headings, namely, etiologic, anatomic, physiologic and functional, we shall restrict ourselves for the most part to the etiologic diagnosis and the functional classification.

Our series fall into four etiologic groups:

- (a) Coronary artery disease
- (b) Hypertensive heart disease and essential hypertension
- (c) Rheumatic heart disease
- (d) Miscellaneous heart disease, including syphilitic and thyroid heart disease and heart disease of unknown origin

At this point it seems desirable to quote from the New York Heart Committee's "Criteria" the functional classification as well as the definition of potential and possible heart disease.

FUNCTIONAL CLASSIFICATION

CLASS I. Patients with organic heart disease able to carry on ordinary physical activity without discomfort.

CLASS II. Patients with organic heart disease unable to carry on ordinary physical activity without discomfort.

- (a) Activity slightly limited
- (b) Activity greatly limited

² Mock, H. E. and Moore, Susan P. The Cardiac Patient in Industry. *J. Indust. Hyg.* 9: 176-186 (May) 1927.
³ Davis, Nathan Smith. III. Cardiovascular Disease and Industry. *Indust. Med.* 2: 287-289 (Nov.) 1933. 3: 317-319 (Dec.) 1934.

CLASS III Patients with organic heart disease and with symptoms or signs of cardiac insufficiency at rest, unable to carry on any physical activity without discomfort

E Possible Heart Disease

Patients who show abnormal signs or symptoms referable to the heart but in whom the diagnosis of heart disease is uncertain should be diagnosed as "Possible Heart Disease, Class E"

F Potential Heart Disease

Patients without heart disease, whom it is advisable to follow because of the presence or history of an etiological factor which might cause heart disease should be diagnosed as "Potential Heart Disease, Class F" In such cases the etiological factor should be stated

To insure accuracy we obtained from the employment department the following items for the majority of employees included in this study: present status, original date of employment, duration of service, type of work and health record (lost time on account of sickness). These items appear in various combinations in the tables presented.

Table 1 gives an analysis of our group of 278 employees with organic heart disease with respect to cause of the condition, present status, health record, functional diagnosis and working period of class II *a* and II *b* employees. We have not included the working period of class I employees in this or other tables because the length of that period depends on when definite organic changes in each case began. In most instances the lesions were well established when first noted by us or our associates.

The interesting features of this summary on organic disease seem to be the large proportion of employees working without symptoms (class I), the relatively good health record of the majority and the substantial periods of employment for those with limited capacity (class II *a* and II *b*).

TABLE 1—Analysis of 278 Cases of Heart Disease

	Health Record					
Etiologic Class	Good	Fair	Poor	Total Percentage		
Coronary artery disease	63	28	16	169	61	
Rheumatic and unknown (rheumatic)	34	7	5	66	24	
Hypertensive disease and essential hypertension	20	9	5	34	12	
Miscellaneous	5	2	2	9	3	
Total	174	76	28	278	100	
	Functional Group					
Present status	I	IIa	IIa IIb	IIb	Total Percentage	
Working	76	62	3	4	145	52
Left	33	6	0	1	41	15
Retired	20	17	3	1	41	15
Died	14	22	12	3	51	18
Total	143	107	18	8	278	100
Working period					Total	
None			11	6	17	
6 months or less			14	2	16	
6 months to 1 year			18	1	19	
1-2 years			18	2	20	
2-3 years			11	1	12	
3-5 years			16	3	19	
Over 5 years			19	3	22	
Total			107	18	125	

CORONARY ARTERY DISEASE 169 CASES

We agree with Levine⁴ and others that the term "arteriosclerotic heart disease" is confusing and misleading, and we have adopted his designation "coronary artery disease" as a better name.

In table 2 A the functional classification and the present status of each employee with coronary artery

disease is shown, and also the working period of such employees in class II *a* and II *b*. Over half of this group are working, and nearly 40 per cent of those working are in class I. The periods in which class II *a* and II *b* employees worked are of considerable length.

TABLE 2—Coronary Artery Disease

A Analysis of 169 Cases						
Present status	Functional Classification				Total Percentage	
	I	IIa	IIa IIb	IIb		
Working	39	53	2	4	98	58
Left	3	1			4	2
Retired	14	11	3	1	29	17
Died	8	18	10	2	38	23
Total	64	83	15	7	169	100
Percentage	38	49	9	4	100	
Working period					Total	
None			7	4	5	16
6 months or less			12	2	1	15
6 months to 1 year			12	1		13
1-2 years			16	2		18
2-3 years			8	1		9
3-5 years			13	3	1	17
5-10 years			12	2		14
Over 10 years			3			3
Total			83	15	7	105
B Age and Length of Service						
Length of Service	Age Years				Total	
	Less Than 49	50-59	60-69	70 and Over		
Under 1 year	1				1	
1-3 years	1				1	
4-9 years	1				1	
7-9 years	1	4	2		7	
10-19 years	4	10	14	4	32	
16-19 years	6	11	8		25	
20-24 years	5	19	14	2	40	
25-29 years	1	5	7	2	15	
30-34 years		11	9	4	24	
35-39 years		6	8	1	15	
40-44 years			2	2	4	
45 years and over		1	2	1	4	
Total	20	67	66	16	169	

Seven employees in the group, because of history and physical signs, were included under a double etiologic diagnosis, "coronary artery disease and rheumatic fever."

Table 2 B shows the number of persons with coronary artery disease grouped as to age and length of service. The majority of the employees in this group are over 50 and their periods of service of considerable length. Hypertension occurred in 112 cases and normal blood pressure in fifty-seven. The anginal syndrome was present in eighteen cases.

In fifty-four of this group coronary thrombosis developed. We have analyzed this subgroup (table 3) with respect to sex, present status, age distribution, health record and working period. All employees who have had coronary thrombosis are considered to be in class II *a*.

Sixty-three per cent, or nearly two thirds, of this group are working. The marked preponderance of men can be explained in part by the ratio of men and women employees in the Rochester plants: 76 per cent men and 24 per cent women (as of Aug 1, 1936). In this group twenty-eight had normal blood pressure and twenty-six hypertension. The anginal syndrome was present in eight. It seems significant to us that in the group in whom coronary thrombosis developed, twenty-five of the fifty-four employees have worked between two and ten years in class II *a* and II *b*.

Fifteen deaths occurred. Of these nine were due to heart disease and in six cases we have no information as to the cause.

⁴ Levine S. A. Clinical Heart Disease. Philadelphia W. B. Saunders Company, Chap. 7, p. 158.

HYPERTENSIVE HEART DISEASE AND ESSENTIAL HYPERTENSION THIRTY-FOUR CASES

To conform to the definition of heart disease due to hypertension, there must be "persistent hypertension associated with enlargement of the heart." Eleven employees showed no demonstrable enlargement of the heart and were considered to be in the group with essential hypertension. We realize that exception may

TABLE 3—Analysis of Fifty-Four Cases of Coronary Thrombosis (Fifty-One Men, Three Women)

Present status		Health record	
Working	33	Good	23
Left	1	Fair	17
Died	1	Poor	7
Retired	5	Unknown	2
Working period—IIa and IIb		Age years	
None	1	Under 40	1
6 months or less	5	40-49	12
6 months-1 year	4	50-59	20
1-2 years	7	60-69	19
2-3 years	7	70 and over	1
3-5 years	0	Unknown	1
5-10 years	0		

be taken to combining this group with the group with hypertensive heart disease. The differential diagnosis however, was so difficult and the series so small that combining the groups seemed a matter of convenience.

Table 4 A gives the present status, functional classification of the group and working period of employees in class IIa and IIb. Table 4 B classifies this group according to age and length of service.

Of the eight deaths in this group, four were due to heart disease, one to cerebral hemorrhage, two to malignant growth and one to accident.

RHEUMATIC HEART DISEASE AND HEART DISEASE OF UNKNOWN (RHEUMATIC) ORIGIN SIXTY-SIX CASES

We have combined with forty-one cases of rheumatic heart disease twenty-five cases in which no history of rheumatic fever, chorea or joint pains could be obtained but in which the valvular lesions were typical of rheumatic fever.

Table 5 A shows this group analyzed with respect to sex, age distribution, present status, functional classification and the working period of employees in class IIa and IIb. Table 5 B shows the group classified according to age and length of service.

Except in one case, there were no signs of an active rheumatic infection.

In this younger age group, in view of the more favorable prognosis of rheumatic heart disease, one would expect to see a larger proportion of employees at work than appears in our series. Of the thirty-one employees who left the company, only one did so because of poor health. The remainder are not working for other reasons.

MISCELLANEOUS HEART DISEASE NINE CASES

Table 6 gives for the employees with miscellaneous heart conditions the etiologic classification, present status, age distribution, duration of service, health record and functional classification and for those in class IIa or IIb the working period.

Two of the syphilitic employees had interesting records. One with a double aortic lesion and aortitis worked in class I for twenty-two years. Since aortic stenosis is almost unknown in syphilitic heart disease, it is possible that a history of rheumatism also existed. Another with a large aneurysm of the ascending aorta worked in class IIb for four years.

Of the two employees with thyroid disease, one with auricular fibrillation has worked in class IIa for eight years. He also has a positive Wassermann reaction of the blood. The employee with paroxysmal tachycardia has definite signs of organic heart disease.

POSSIBLE HEART DISEASE 187 CASES

The group with possible heart disease includes employees showing certain "abnormal signs or symptoms referable to the heart," such as apical or basal systolic murmurs, slight hypertension and borderline abnormalities in the electrocardiogram which make further follow-up advisable (table 7).

POTENTIAL HEART DISEASE NINETY CASES

For the employees with potential heart disease a history of rheumatic fever, chorea or joint pains or a positive Wassermann reaction was obtained. Thirty-one employees in this group were also found to have signs or symptoms suggestive of heart disease (table 7).

Many of the employees with possible or potential cardiac abnormalities are comparatively new employees. After further observation we hope to make a complete report on this interesting group.

MANAGEMENT

On the whole, the cooperation of the employees has been excellent. The majority have been interested in the results of the examinations. We have been careful to avoid making them heart conscious and apprehensive, appreciating that it would be easy to cause a cardiac neurosis. Care has been taken to assure

TABLE 4—Hypertensive Heart Disease and Essential Hypertension

A Analysis of Thirty Four Cases					
Functional Classification					
Present status	I	IIa	IIa IIb	IIb	Total
Working	17	2			19
Left	4	1			5
Retired	2	4			6
Died		3			3
Total	24	10	0	0	34
Working period	IIa				
None					4
6 months or less					1
6 months-1 year					2
1-2 years					1
2-3 years					1
3-5 years					1
Total					10
B Age and Length of Service					
Length of Service	Age Years				
	30-39	40-49	50-59	60-69	70
Under 1 year					
1-5 years			1	1	2
6-9 years			1		1
10-14 years				5	5
15-19 years	2	2	4	3	11
20-24 years		1	2		3
25-29 years		1	1	3	5
30-34 years		1	1	2	4
35-39 years and over			1		1
Total	2	5	11	14	2

the employees that the examinations were not made with the object of disqualifying them for further work but rather with the object of keeping them from overtaxing their cardiac reserve.

As a rule, the medical department limits itself to giving advice on matters of hygiene. Avoidance of colds and correction of overweight are particularly stressed with this group. Except in cardiac emergencies treatment is left entirely to the family physician.

Checks are made at times on the adequacy of digitalis medication and the regularity of antisyphilitic treatment. Any deviation from accepted treatment is reported to the employee's physician. When failure is imminent, the employee is sent home and his physician notified. Copies and interpretations of routine electrocardiograms are sent to the family physician. Employees who have had heart failure are returned to work very gradually and are usually given half-day employment for several weeks.

The company provides group insurance, coverage and a retirement plan, whereby an annuity is paid to men employees over 65 years of age with twenty years of service and to women employees over 60 years of age with fifteen years of service. Benefits are also pro-

TABLE 5—*Rheumatic Heart Disease and Heart Disease of Unknown (Rheumatic) Origin*

A Analysis of Sixty Six Cases (Twenty Nine Men Thirty Seven Women)							
Functional Classification							
Present status	I	IIa	IIa IIb	IIb	Total		
Working	23	5	1		29		
Left	27	4			31		
Retired	2	2			4		
Died			1	1	2		
Total	52	11	2	1	66		
Working period	IIa	IIa IIb	IIb	Total			
None		1	1	2			
6 months or less	1			1			
6 months 1 year	2			3			
1-2 years	3			3			
2-3 years	1			1			
3-5 years	1			1			
Over 5 years	3	1		4			
Total	11	2	1	14			
B Age and Length of Service							
Age Years							
Length of Service	Under 19	20-29	30-39	40-49	50-59	60 and Over	Total
Under 1 year	1	7	3				11
1-3 years	1	10	2	2			15
4-9 years		3	2		3		8
7-9 years		1	2				3
10-15 years		2	6	4	1		13
16-19 years			2	4	3	2	11
20-24 years				1			1
25-29 years				2			2
30-34 years					1		1
35-39 years						1	1
Total	2	23	17	13	8	3	66

vided for employees who are totally and permanently disabled. A waiting period of six months is required before disability payments are started, and in many cases sick benefit allowance carries employees during this waiting period. This retirement annuity and disability benefit plan makes it easier to deal with employees with heart disease who are progressing unfavorably.

MEDICOLEGAL ASPECTS

There has been but one sudden death at work in our series over a period of seven years. The employee involved was an executive who had coronary artery disease with marked hypertension. He probably died of coronary thrombosis. No autopsy was performed.

We do not know of any case in our series in which an accident aggravated existing heart disease. This is an experience similar to that which Clark⁵ reported. We have tried to follow his practice of placing employees with heart disease, especially elderly ones, where no accident hazard exists.

It is interesting to note that Masters⁶ in a recent article discussed the role of effort, trauma and other

factors in the precipitation of coronary artery thrombosis. His conclusion, which we feel is important, is quoted in part:

Coronary artery thrombosis develops irrespective of the form of activity whether it be strenuous, moderate, or slight effort or rest. Neither does excitement, climbing a hill against the wind, cold weather or eating exert an influence. All these factors, however, play a material part in the production of an

TABLE 6—*Miscellaneous Heart Disease*

Etiologic Classification	Present Status	Age Group	Functional Classification	Duration of Service Years	Health Record	Working Period if
Syphilitic	Died	50-59	IIa IIb	7-9	Good	3 months
Syphilitic	Retired	60-69	I	30-35	Poor	
Syphilitic	Died	60-69	IIa IIb	40-44	Fair	2½ years
Syphilitic	Died	50-59	IIb	16-19	Good	4 years
Thyroid	Working	50-59	IIa	23-29	Good	8 years
Thyroid	Working	60-69	IIa	20-24	Good	8 years
Unknown (emphysema)	Left	40-49	I	16-19	Fair	
Unknown (paroxysmal tachycardia)	Retired	40-49	I	30-34	Poor	
Unknown (rheumatic or congenital)	Working	20-29	I	7-9	Good	

attack of angina pectoris, and the confusion resulting from failure to make a differential diagnosis between an anginal syndrome and coronary thrombosis has led to the more or less prevalent idea that strenuous labor contributes to the formation of coronary thrombosis. Coronary thrombosis and the anginal syndrome are both the result of coronary artery disease, but aside from that have nothing in common.

It has been our policy when the anginal syndrome is present to curtail the employee's activities or, if necessary, advise a period of complete rest.

In a few employees, thrombosis occurred while they were at work. Nevertheless, in no case were we of the opinion that the work was the precipitating factor. It is of interest that, of fifty-two employees with coronary thrombosis, twenty-one were clerical or executive workers and fifteen were engaged in light factory work, eight in medium factory work and eight in heavy factory work. The fifty-two cases occurred among the 169 employees found to have coronary artery disease, whose work was as follows: clerical or executive work fifty-six, light factory work fifty-three, medium factory work forty and heavy factory work twenty. In view

TABLE 7—*Possible and Potential Heart Disease*

	Men	Women	Total
Possible heart disease			
Total	10	7	187
Working	98	32	131
Not working	2	24	36
Potential heart disease			
Working	42	19	61
Syphilitic	17	5	22
Rheumatic	25	11	36
Not working	13	16	29
Syphilitic	4	1	5
Rheumatic	9	15	24
Total	55	35	90
Syphilitic	21	9	30
Rheumatic	34	26	60

of the precautions taken to prevent undue exertion when coronary artery disease was known to be present, we do not feel that our experience justifies a broad assertion that exertion cannot be the precipitating factor.

SUMMARY AND CONCLUSIONS

The use of an etiologic, anatomic physiologic and functional diagnosis has been found valuable in the selective employment and management of persons with heart disease.

⁵ Clark, W. Irving. Effects of Accidents on Cardiac Employees. *Am Heart J* 3: 539 (June) 1928.

⁶ Masters, Arthur M. Coronary Artery Thrombosis. *J Indust Med* 6: 307 (May) 1937.

Employees whose cardiac reserve was limited (class IIa and IIb) have been continued in employment for relatively long periods. We feel that proper placement and careful supervision have contributed to this result.

We believe that benefits accrue from recognizing many cases of heart disease which would otherwise be neglected until much further advanced. Opportunity is afforded to study heart disease in the preclinical stage (possible and potential heart disease).

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ABSTRACT OF DISCUSSION

DR ERNST P. BOAS, New York. The subject discussed by Drs. Crain and Missal concerns itself with the problem: Can the patient with heart disease work and, if so, what kind of work can he do? This is as important as medical treatment. Far too often the physician insists on the patient's retirement. The heart lesion becomes so magnified in the eyes of the physician and the patient that the patient lives just for his heart. As Drs. Crain and Missal have shown, such enforced invalidism is often quite unnecessary. It takes courage for the physician to keep a cardiac patient at work for, if things go wrong, the physician will be blamed. The authors' observations, carried on over many years, demonstrate that patients with serious heart ailments can continue in industry without harm to themselves. Yet it is almost the rule to tell a patient who has had a coronary thrombosis that he is finished and must retire. I see many men with valvular disease and coronary artery disease and coronary thrombosis, the majority of whom return to work in factories or as painters and carpenters from economic necessity. Most of them get along fairly well. It is rare in my experience for the work as such to bring about death or even to hasten the evolution of the cardiac ailment. Patients with angina pectoris who have to travel long distances to and from work complain more of distress in traveling than they do of any distress while at work. Severe physical strain may aggravate a cardiac condition, although there are some who believe that it cannot precipitate a coronary thrombosis. I disagree with that. I recall instances in which a physician ran up four flights of stairs and when he reached the top had a sudden agonizing pain and showed classic symptoms of coronary thrombosis, and of working men who, following unusual, unexpected strain had immediate symptoms of coronary thrombosis. In a similar manner, heart failure or an attack of auricular fibrillation may be induced. A heart condition is compensable only if pain, dyspnea and incapacity follow immediately on some accident in industry. Drs. Crain and Missal have shown that these patients at work must be under medical supervision. Even if no sudden, acute insult precipitates a dramatic progress of the heart lesion, continuous, insidious overstrain will undoubtedly shorten the life of the cardiac patient. Knowledge of the effects of different kinds of work on the status of a cardiac patient is still very sketchy. The authors have made a real approach to establishing some fundamental facts in this regard. Their study demonstrates the tremendous value of a continuous study of a large group of workers in industry over a long period of time.

DR W. D. STROUD, Philadelphia. Two years ago I presented this subject before this section, suggesting that a great many more cardiac patients were employable than were being employed. Forty thousand workers were directly observed in the performance of 1,000 operations in twenty-five industries. It was concluded that, in normal times, of the 200,000 odd jobs in manual work in Philadelphia industries 25 per cent, or 50,000 could be performed by persons having heart disease without compromising either the job or the job holder. This fact, I believe, is not fully understood by the average employer, and, as Drs. Crain and Missal's paper shows, between six and seven of every hundred employees in the average plant, if carefully examined, would lose their jobs on account of cardiovascular defects, if the employer wished to be absolutely safe from the standpoint of the compensation laws, in which the family of a worker receives compensation should death occur as a result of his work. Also on examining men for employment, a large group would be refused employment because of cardiovascular abnormalities. Here are men wishing to work who are unneces-

sarily refused jobs. This seems tragic to those of us who during the past few years have observed so many preferring relief to actual jobs. Too often a physician finds a murmur or a mild hypertension or even early symptoms of coronary disease and tells that man he must give up his position and then does not assume the proper responsibility in helping such a person secure other employment. As Drs. Crain and Missal have shown, such persons may be kept in their jobs if there is a proper understanding between the employer, the employee and the plant physician. This entire subject is a matter of educating the public, the employer and the general practitioner. This education and placement in industry can be accomplished by local heart and tuberculosis organizations. It is their job, through trained placement workers, to persuade employers that class I and class IIa patients are employable and are usually more conscientious in their work than those without such handicaps. I am glad to see that Drs. Crain and Missal at Rochester regularly permit the employment of persons with mild hypertension. Too many persons have been made invalids for the rest of their lives through the discovery of questionable hypertension.

DR R. B. CRAIN, Rochester, N. Y. Dr. Boas spoke of the medicolegal aspects. There wasn't time to go into that. We had in our series but one sudden death occurring at work and that was probably due to a coronary thrombosis. There has been, to my knowledge, no aggravation of existing heart disease in employees at work. Dr. Stroud voiced his approval of the employment of the patient with mild hypertensive disease. We decided to follow such a policy only after surveying the records of a considerable number of hypertensive persons already at work and finding that many of them had worked for periods of from ten to fifteen years without symptoms.

A STUDY OF PEPTIC ULCER BASED ON NECROPSY RECORDS

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Until the advent of modern surgical methods and the use of the roentgen ray, gastric ulcer was believed to be more frequent than duodenal ulcer. Reports from Europe still show that it is, in the United States, clinical and surgical experience indicate that duodenal ulcer is far more frequent, but observations at necropsy fail to bear this out.

For 1931 the division of vital statistics at Washington reported 4,978 deaths from ulcer of the stomach (4.2 per cent) and 2,281 deaths from ulcer of the duodenum (1.9 per cent), with a total incidence of 6.1 per cent.

The literature dealing with the incidence of peptic ulcer in clinical and surgical material is copious (Mayo-Robson,¹ Hinton,² Streicher,³ Sanders,⁴ Percy and Beilin,⁵ Smithies⁶ and others). However, it is very difficult to gather evidence obtained at necropsy. Before the Great War, Rutimeyer⁷ gave the geographic incidence of peptic ulcer in necropsy material as follows:

- Dr. Jaffé died Dec. 17, 1937.
Owing to lack of space this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the authors' reprints.
Read before the Section on Gastro-Enterology and Proctology at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 9, 1937.
- 1 Mayo-Robson, A. W. Brit. M. J. 1: 248, 1907.
 - 2 Hinton, J. W. Ann. Surg. 94: 1044-1049 (Dec.) 1931.
 - 3 Streicher, M. H. Illinois M. J. 63: 340-342 (April) 1933.
 - 4 Sanders, L. C. South. M. J. 26: 353-422 (April) 1933.
 - 5 Percy, N. M. and Beilin, D. S. Am. J. Roentgenol. 32: 179-188 (Aug.) 1934.
 - 6 Smithies, Frank. Am. J. Digest. Dis. & Nutrition 1: 697-704 (Dec.) 1934.
 - 7 Rutimeyer, Leopold. Geographic Incidence and Diagnosis of Peptic Ulcer. Wiesbaden, J. F. Bergmann, 1906. in Henke, Friedrich and Lubarsch, Otto. Handbuch der speziellen Pathologischen Anatomie und Histologie. Berlin, Julius Springer, 1928.

Austria, Bohemia, Poland, 4 per cent, Denmark, 16.7 per cent, England, 5 per cent, Germany, 5 per cent, North America, 13 per cent, North China, Japan, from 2 to 14.79 per cent, Russia, 0.8 per cent, Switzerland, 2.6 per cent

In a study of peptic ulcer in Russia, Hamperl⁸ found that in necropsy material the incidence was from 0.5 to 1 per cent for a period before 1918, from 12.8 to

Jan 1, 1929, to Dec 31, 1936, under the direction of Dr Jaffe at Cook County Hospital, Chicago

According to table 1, definite pathologic evidence of activity was noted in 339 cases of peptic ulcer—118 cases in which peptic ulcer was the essential lesion and 221 cases in which it was incidental. It is interesting to observe that, when peptic ulcer was the essential lesion, duodenal ulcer predominated in frequency (sixty-three cases of duodenal ulcer and fifty-five cases of gastric ulcer), while, when peptic ulcer was incidental, gastric ulcer predominated in frequency (130 cases of gastric ulcer and ninety-one cases of duodenal ulcer). Examination of figure 1 reveals that when peptic ulcer is the essential lesion the incidence of gastric ulcer falls after a small peak at the age of 31, increases at 41, reaches a high peak at 51 and then decreases gradually to 70. The incidence of duodenal ulcer in this group reaches a peak at the age of 31, remains at a plateau till 40 and then gradually decreases till 70. When peptic ulcer is the incidental lesion, the gastric lesion increases in frequency from the age of 20, reaches a high peak at 51 and then decreases, but the incidence still remains high at 70. The lesion of the duodenum as an incidental condition has two peaks, one at the age of 41, after which it falls slightly to 51, and a second higher peak at 61.

Comparing figures 1 and 2, one finds that the data for both males and females plotted in figure 1 are essentially repeated for the males in figure 2. To repeat, the peak for the incidence of gastric ulcer (incidental and essential) falls for the age group between 51 and 60, except for a small peak for the essential lesion between 31 and 40. The duodenal lesion as an essential factor increases in incidence between the ages of 31 and 40 and remains at the high level until the period, between 51 and 60. The incidence for both the essential and the incidental duodenal lesion in the male has a peak from 41 to 50 with a second peak for the incidental lesion from 61 to 70.

As indicated in table 2, the relative incidence of peptic ulcer in the white male was 2.9 per cent for gastric and 2.3 per cent for duodenal ulcer, while in

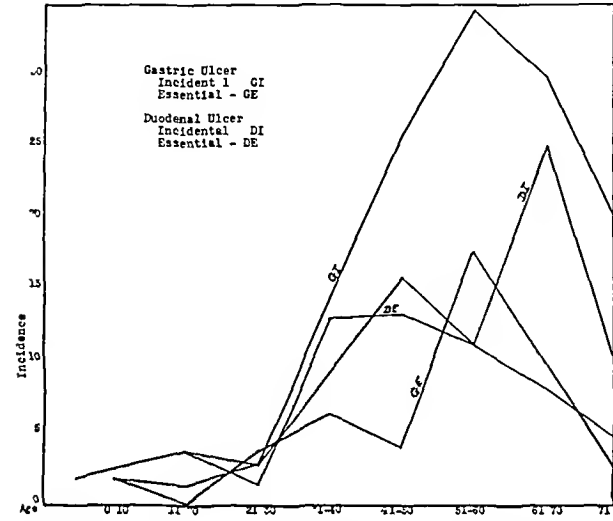


Fig 1—Total incidence of active ulcers of the stomach and the duodenum

17 per cent in the period of hunger from 1918 to 1922 and only 0.85 per cent during the period from 1922 to 1929.

In 1914 Clark⁹ reported a series of necropsies in the Panama Canal Zone, in which the total incidence of peptic ulcer was found to be 4.5 per cent, the incidence in the West Indians was 5.39 per cent, in the Latin Americans or Mestizos, 2.8 per cent and in the white population 2 per cent.

In a series of necropsies performed at Rosario, Argentina, South America, from 1922 to 1927, Ruiz¹⁰ found that the incidence of peptic ulcer was 2.9 per cent (the ratio of gastric to duodenal ulcer was 4:1, with predominance in the male).

Kouwenaar,¹¹ in a report in 1930, stated that the incidence of peptic ulcer in Chinese examined post mortem in Java was 10.10 per cent, in Indian coolies 5.6 per cent and in Javanese 0.95 per cent.

In a large series of necropsies performed at Leeds General Infirmary up to 1929, Stewart¹² observed acute peptic ulcer in 3.93 per cent, 2.93 per cent of the ulcers were gastric, and 1 per cent were duodenal. Chronic peptic ulcer had an incidence of 6 per cent, gastric ulcer an incidence of 3.8 per cent and duodenal ulcer an incidence of 2.2 per cent. These data indicate that when the peptic ulcer is acute the gastric lesion predominates in frequency while when the peptic ulcer is chronic the duodenal lesion predominates in frequency.

Our present study concerns the incidence of peptic ulcer in 9,171 consecutive necropsies performed from

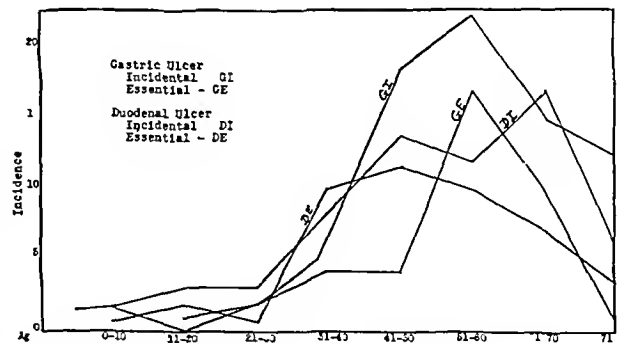


Fig 2—Incidence of active ulcers of the stomach and the duodenum in the male

the white female the incidence was 1.3 per cent for gastric and 0.7 per cent for duodenal ulcer. For the Negro male the incidence of duodenal ulcer was slightly higher than the incidence of gastric ulcer, while the total incidence of peptic ulcer for the Negro male was lower than for the white male (ratio of 3 to 5.2 per cent, respectively). There was not much difference in the incidence of peptic ulcer in the females of the two races.

The observation has often been made in the literature that peptic ulcer in Negroes is a comparative rarity.

⁸ Hamperl H. *Ergebn d allg Path u path Anat* 26: 353-422, 1932.

⁹ Clark H C. *Proc M A Isthmian Canal Zone* April-October 1914.

¹⁰ Ruiz Fernando cited by Müller Hugo. *Am J Surg* 23: 496-502 (March) 1934.

¹¹ Kouwenaar W. *Nederl tijdschr v geneesk* 74: 2321 (May 3) 1930.

¹² Hurst A E and Stewart M J. *Gastric and Duodenal Ulcer*. New York: Oxford University Press, 1929.

The foregoing data from Cook County Hospital do not confirm this statement. In a consecutive series of 6,977 necropsies performed by Dr Jaffe¹³ from 1929 to 1934 the incidence of peptic ulcer in Negroes was 3.5 per cent, and in white persons it was 5.23 per cent. Steigmann¹⁴ reported that in 67,831 patients admitted to

TABLE 1—Total Incidence of Active Ulcers of the Stomach and the Duodenum in 9,171 Consecutive Autopsies from Jan 1, 1929, to Dec 31, 1936

Age Group	Stomach				Duodenum				Total	
	White		Negro		White		Negro			
	Male	Female	Male	Female	Male	Female	Male	Female		
	Essential Lesion	Incidental Lesion	Essential Lesion	Incidental Lesion	Essential Lesion	Incidental Lesion	Essential Lesion	Incidental Lesion		
	Essential Lesion	Incidental Lesion	Essential Lesion	Incidental Lesion	Essential Lesion	Incidental Lesion	Essential Lesion	Incidental Lesion		
0-5	0	0	0	0	0	1	0	1	0	0
6-10	2	0	0	0	0	0	0	1	0	0
11-20	0	1	0	0	0	0	1	1	0	1
21-30	2	1	1	0	1	1	1	0	1	0
31-40	3	4	2	1	12	3	2	0	4	4
41-50	5	15	0	1	10	3	0	1	4	0
51-60	17	21	0	4	8	6	1	0	4	6
61-70	11	11	1	9	3	0	6	1	5	0
Over 70	1	12	1	5	4	7	0	3	0	0
	41	67	5	20	43	35	4	11	12	27
									4	9

cent, in this one regard our results are comparable, since with nine cases of double ulcer in a total of 120 cases of peptic ulcer as the main lesion the percentage would be 7.5. In a group of cases in which peptic ulcer was the incidental lesion, the results are more commensurate and will be discussed later (table 7).

Walters and Snell¹⁵ found it difficult to obtain statistics on the relative frequency of the various complications of ulcer in Germany. They found that hemorrhage was more common than in the United States, in many instances there were definite symptoms of obstructive as well as of acute perforating and chronic penetrating lesions. The incidence of hemorrhage in patients with peptic ulcer who came to necropsy varies from 1 to 10 per cent as given by European workers (Kossinsky, Wolowelsky, Schneider, Scheuermann, Krauss, Oppenheim, Hoffmann, Lohr and others). Hemorrhage is reported to be most frequently duodenal in origin, acute perforation (from 9 to 10 per cent) is most frequently in the anterior gastric wall, and pyloric stenosis is reported to have an incidence of 4 per cent of all peptic ulcers, some workers bringing the figures to abnormally higher proportions.

In material studied at San Francisco Hospital from 1928 to 1935, Goldman¹⁷ found the mortality from peptic ulcer to be 17 per cent, this included perfora-

five cases gastro-entero-anastomosis was performed, in two of these a recent exacerbation of fibrous tuberculosis of the lungs had occurred.

That death from gastric hemorrhage is far less frequent than one might suppose is proved by the fact that only 0.43 per cent of the patients (thirty-seven patients of 9,171 examined post mortem) died of gas-

TABLE 5—Cause of Death

Incidence and Percentage in 120 Necropsies in Which Peptic Ulcer Was the Essential Lesion			
	Stomach	Duodenum	Total
Hemorrhage	22 or 18.3%	15 or 12.5%	37 or 30.8%
Perforation	24 or 20.0%	43 or 35.8%	67 or 55.8%
Stenosis	9 or 7.5%	5 or 4.2%	14 or 11.6%

Principal Lesions That Were Associated with Perforation and Percentage in 120 Necropsies in Which Peptic Ulcer Was the Essential Lesion			
	Stomach	Duodenum	Total
Diffuse peritonitis	10 or 8.1%	22 or 18.3%	43 or 35.8%
Without operative closure	2 or 1.7%	9 or 7.5%	11 or 9.1%
With operative closure			
Subphrenic abscess			10 or 12.5%
Bilateral		1 or 0.8%	1 or 0.8%
Right side	3 or 2.5%	7 or 5.8%	10 or 8.1%
Left side	3 or 2.5%	1 or 0.8%	4 or 3.3%
Perigastric abscess	3 or 2.5%	3 or 2.5%	6 or 5.0%
Intrasplenic abscess	1 or 0.8%		1 or 0.8%
Subphrenic abscesses with associated lesions			10 or 12.5%
Pleural empyema		7 or 5.8%	
Fibrinous pericarditis		1 or 0.8%	
Perforation into stomach		1 or 0.8%	
Perforation into stomach and colon		1 or 0.8%	
Perigastric abscess			6
Perforation into pleural cavity			1
Stenosis			14 or 11.6%
Cachexia			3
Gastro-entero-anastomosis			5
Exacerbation of tuberculosis			2

TABLE 4—Multiple Ulcers or Ulcer Scars

	No. of Cases
A Ulcer of the stomach as essential lesion with ulcers of duodenum	3
Ulcer of the stomach as essential lesion with scar in duodenum	1
B Ulcer of the duodenum as essential lesion with ulcer of stomach	6
Ulcer of the duodenum as essential lesion with scar in stomach	1
C Ulcer of the stomach with scars in stomach	2
D Ulcer of the duodenum with scars in duodenum	1

tion 32 per cent, gross hemorrhage 11.1 per cent and other associated lesions, such as pneumonia and cerebral or cardiac thrombosis, 4.9 per cent. Babey,¹⁸ from England, reported that hemorrhage was the cause of death in 1.1 per cent of all the patients with peptic ulcer admitted and in 4.8 per cent of all the patients with peptic ulcer admitted with hemorrhage, his statistics gathered from all parts of the world give the incidence of death from hemorrhage as varying from 1 to 25 per cent for patients admitted to hospitals for treatment of peptic ulcer.

In table 5 are given the causes of death in the group of 120 cases in which peptic ulcer was the essential lesion at necropsy. Hemorrhage was found to be the most frequent cause of death in cases of gastric ulcer and perforation in cases of duodenal ulcer. This does not agree with postmortem reports from Europe, which show that hemorrhage is more frequently duodenal and perforation more frequently gastric in origin. The complications associated with perforation (table 5) in our series do not differ materially from those reported in the literature. In two cases in our series subphrenic abscess was complicated by thrombophlebitis of the gastric veins, and in a third case thrombophlebitis was associated with perigastric abscess. In two of the cases thrombophlebitis was further complicated by pylophlebotic abscesses of the liver.

All the fourteen patients who died of stenosis were admitted to the hospital in a cachectic condition. In

tric hemorrhage. This agrees with the experience in other large institutions, such as Guy's Hospital in England, Mount Sinai Hospital in New York and San Francisco Hospital. Death from perforation of a peptic ulcer occurred in 0.7 per cent of the cases (sixty-seven of 9,171 cases). The predominance of death due to perforation over death due to hemorrhage of a peptic ulcer is also borne out by the literature.

In examining the data given in table 6 one finds that hypertensive heart disease as an associated lesion with peptic ulcer is prominent, slightly more prominent for

TABLE 6—Associated Pathologic Conditions

	Stomach	Duodenum
Hypertensive heart disease	10	9
Chronic endocarditis	4	2
Coronary sclerosis	0	2
Anterior coronary occlusion	0	2
Syphilitic aortitis	9	7
Pulmonary emphysema	2	0
Pulmonary tuberculosis	3	1
Lung abscess	1	0
Goiter	7	17
Cholelithiasis	1	6
Cholecystitis	1	1
Cirrhosis of liver	1	1
Red atrophy of liver	1	0
Chronic nephritis	0	1
Nephrolithiasis	0	1
Hypertrophy of prostate	3	8
Carcinoma of prostate	0	1
Cerebral lesions	2	2
Tuberculosis	0	1
Diabetes	1	0
Sickle cell anemia	1	0

gastric than for duodenal ulcer, the same incidence is given for syphilitic aortitis, goiter occurred more often with duodenal than with gastric ulcer. The incidence according to age can explain the coexistence of hypertrophic prostate in some of the cases. The marked coexistence of goiter can be dismissed with the statement that the lesion was in the main nonsymptomatic and in most instances was simple colloid in character, without

17 Goldman Leon Gross Hemorrhage from Peptic Ulcer J A M A 107 1537 1542 (Nov. 7) 1936
18 Babey A M Guy's Hosp Rept 86 129 143 (April) 1936

clinical or anatomic evidence of hyperfunction. In a series of 2,100 necropsies performed by Clark⁹ in the Panama Canal Zone, ninety-four peptic ulcers were observed, twenty-five of them associated with arteriosclerosis (26.4 per cent), twenty-two with syphilis (24.2 per cent) and seven with organic heart disease (7.4 per cent).

TABLE 7—Ulcer of the Stomach and the Duodenum as Incidental Lesions

	Stomach		Duodenum		Total	
	No	Per centage	No	Per centage	No	Per centage
Acute	65	50	12	13	77	34.7
Subacute	32	24	41	41	73	33.1
Chronic	33	26	38	42	71	32.2
	130		91		221	
Multiple	67	51	37	41	104	44.8

In our study, cholecystic disease was associated with gastric ulcer in one case and with duodenal ulcer in six cases and comprised 2.1 per cent of all the active peptic ulcers (339) demonstrated at necropsy. Reports from the literature (McVicar and Weir,¹⁹ Rivers and Mason,²⁰ Laird²¹ and others) indicate that surgical material often shows a coincidence of peptic ulcer and cholecystic disease, the percentage varying from 4 to 8. However, Laird pointed out that this incidence is not much higher than that for the general population. When one remembers that peptic ulcer was observed in approximately 5 per cent of all our necropsies, it would seem that our incidence is even lower than the reported figures show.

Appendicitis is often mentioned as an important associated lesion. Since the appendixes did not show any gross changes, microscopic study was omitted, and therefore this coincidence is not discussed here. In one of the cases in which ulcer was associated with tuberculosis, generalized amyloidosis included the intestine. Both instances of jejunal ulcer followed gastro-

TABLE 8—Diseases Accompanied by Ulcers and Ulcer Scars as Incidental Lesions

	Stomach	Duodenum
Diseases of		
Heart and blood vessels	40	27
Respiratory tract*	21	22
Digestive tract*	21	14
Urinary tract*	21	12
Hemopoietic organs	4	0
Central nervous system†	21	29
Endocrine glands	2	0
Bones, joints and muscles	4	1
Carcinoma of		
Head and neck	7	4
Respiratory tract	8	5
Digestive apparatus	7	6
Urinary tract	2	1
Cervical	4	5
Tumors of the central nervous system	3	2
Unclassified	6	7
	169	136

* Excluding malignant neoplasms
† Excluding tumors

jejunostomy, in one of these cases the ulcers were multiple and the patient died of hemorrhage, while in the other case the ulcer was single and the patient died of perforation.

Concerning the much discussed question of the relations between peptic ulcer and gastritis or duodenitis,

19 McVicar C S and Weir J F M Clin North America 12 1531 (May) 1929
20 Rivers A B and Mason J B Minnesota Med 14 330 335 (April) 1931
21 Laird E J New England J Med 213 764 767 (Oct 17) 1935

postmortem observations do not permit any definite conclusion. Postmortem changes of the mucosa greatly interfere with microscopic examination, and it has been our observation that these changes are particularly apt to occur in cases of peptic lesions. Can this be due to the alleged hyperacidity of the gastric juice associated with ulcer? Even in cases in which gastric and duodenitic changes could be demonstrated, it is uncertain whether the inflammation preceded the ulcer or was secondary to it. Walters and Sebening²² stated that the patients operated on at the Mayo Clinic showed only a rare association of gastritis and that this is in contradistinction to the contention of Konjetzny and the various clinics of Germany, whose patients showed gastritis and ulceration. However, Aschner and Grossman,²³ from New York, found microscopic evidence of gastritis in 64 per cent of the specimens which grossly seemed normal.

ULCER OF THE STOMACH AND THE DUODENUM AS INCIDENTAL LESIONS

It was stated earlier that there were 120 cases of peptic ulcer in which the lesion was dominant in the diagnosis and that there were 221 cases in which the peptic ulcer was active but was incidental to another lesion which was the cause of death. In other words,

TABLE 9—Scars

Age	Stomach				Duodenum			
	White Males	White Females	Negro Males	Negro Females	White Males	White Females	Negro Males	Negro Females
0-5								
6-10								
11-20								
21-30				1			2	
31-40	1			2	1		1	1
41-50	5	2	2	1	4	1	3	1
51-60	7	2	1	5	12	4	3	1
61-70	8	3		2	9	1		1
Over 70	2				2			
Total	23	7	3	12	23	7	12	6
Summary								
Stomach	43 scars of which 6 were associated with active ulcers							
Duodenum	52 scars of which 7 were associated with active ulcers							
Total	97 scars of which 13 were associated with active ulcers							

the incidental lesion was observed almost two times as frequently as the essential lesion in our series of necropsies. Hart²⁴ and Holzweissig²⁵ from 1914 to 1921 by careful examination found the incidence of acute or chronic ulcer in the stomach to be 6.9 per cent and in the duodenum 5.3 per cent in 3,058 necropsies. The marked incidence of peptic ulcer without specific symptoms and as an incidental lesion and the tendency of acute lesions to heal without leaving demonstrable scars lead one to conclude that ulcer may be more common in the gastro-intestinal tract than is generally supposed, substantiating the statement that about 10 or 12 per cent of the general population have or have had at some time a gastric or duodenal ulcer.

It is evident from table 7 that acute gastric lesions are more common than acute duodenal lesions, while duodenal lesions are more often subacute or chronic than gastric lesions. A similar tendency was first mentioned in the discussion of table 3, which summarized the cases in which peptic ulcer was the essential lesion. The multiplicity of the lesion in this series may be

22 Walters W L and Sebening W M Minnesota Med 15 579 584 (Sept) 1932
23 Aschner P W and Grossman S Surg Gynec & Obst 57 334-342 (Sept) 1933
24 Hart C Mitt a d Grenzgeb d Med u Chir 31 350 1918
25 Holzweissig M Mitt a d Grenzgeb d Med u Chir 35 16 1922

compared with table 4. Although surgical material indicates that multiple lesions occur more often in the duodenum, our series does not confirm this observation. The tendency to chronicity of the duodenal lesion in this and a previous series may be compared

TABLE 10—Location of Gastric and of Duodenal Ulcers

A Ulcer of stomach			
1 Within 5 cm from the pyloric ring		116	or 59.1%
Lesser curvature		97	
Greater curvature		3	
Anterior wall		10	
Posterior wall		6	
2 Lesser curvature more than 6 cm above pyloric ring or 3 cm below the cardia		49	or 26%
3 Within 3 cm from the cardia		14	or 7.1%
4 Fundus		12	or 6.1%
5 Anterior wall		4	or 2.0%
6 Greater curvature		1	or 0.5%
	Anterior Wall	Posterior Wall	
B Ulcer of duodenum			
1 Less than 5 mm from pyloric ring	63	30	35
2 5-10 mm from pyloric ring	37	14	23
3 11-20 mm from pyloric ring	31	5	26
4 21-50 mm from pyloric ring	17	8	9
5 More than 50 mm from pyloric ring to point just above papilla of Vater	8	3	5
	158	60	98

TABLE 11—Summary of All Cases

	Stomach	Duode num	Com bined	Jejunum	Total
Essential diagnosis	53	63		2	120
Incidental lesion	130	91			221
Combined gastric and duodenal lesion			19		19
Scars	89	43			84
Scars with active ulcers	6	7			13
	230	206	19	2	457

with table 9, in which the incidence of scars in the duodenum is found to exceed that in the stomach, with a predominance of scars in both stomach and duodenum in the age group 50 to 70. It is well known that healing early in life is less apt to be accompanied by macroscopically demonstrated scar formation than later in life.

Ulcer and ulcer scars were associated with other diseases as shown in table 8. It is interesting to note that diseases of the heart and blood vessels, of the respiratory tract, of the digestive tract and urinary tract other than malignant process, and of the central nervous system other than tumor, were the diseases most frequently associated with ulcer of the stomach and the duodenum. It is also noted that peptic ulcer was frequently associated with malignant processes, particularly in the respiratory and the digestive tract. As far as malignant processes are concerned, the relative incidence of the different types is about the same. Cancer of the digestive and the respiratory tract is considerably more frequent than cancer of the head and neck or the urinary tract.

Scars of gastric and of duodenal lesions were equally common between the ages of 41 and 70. Scars of duodenal ulcers occurred in more patients between the ages of 50 and 70 than at any other ages. Of forty-five gastric scars, six were associated with active lesions, while of fifty-two duodenal scars, seven were associated with active lesions.

The exact location of 196 gastric and 158 duodenal ulcers was given in the autopsy record. For gastric ulcers the distance was measured from the pyloric ring to the lower border of the ulcer or from the cardia to the upper border of the ulcer, while for duodenal ulcers

the distance was measured from the pyloric ring to the upper border of the ulcer. Of the ulcers of the stomach 116, or 59.1 per cent, were within 6 cm from the pyloric ring, ninety-seven were in the lesser curvature, three in the greater curvature, ten in the anterior wall and six in the posterior wall. Forty-nine ulcers, or 25 per cent, were in the lesser curvature more than 6 cm above the pyloric ring or 3 cm below the cardia. Fourteen, or 7.1 per cent, were within 3 cm from the cardia, 12, or 6.1 per cent, in the fundus, 4, or 2.0 per cent, in the anterior wall, and 1, or 0.5 per cent, on the greater curvature. It is evident that ulcer of the lesser curvature of the stomach is far more common than ulcer of the greater curvature. Sixty-five duodenal ulcers were less than 5 mm from the pyloric ring, with thirty situated on the anterior wall and thirty-five on the posterior wall, seventeen were from 21 to 50 mm from the pyloric ring, with eight on the anterior wall and nine on the posterior wall. Eight lesions were more than 50 mm from the pyloric ring to a point just above the papilla of Vater, three on the anterior wall and five on the posterior wall. Further analysis reveals that of the 158 ulcers sixty were on the anterior wall and ninety-eight on the posterior wall and only 15 per cent were more than 20 mm from the pyloric ring. The higher incidence of perforation in duodenal ulcer cannot be entirely attributed to the anterior position of the ulcer, in which position perforation most often occurs, however, the number of ulcers on the anterior wall of the duodenum surpass by far (four times) the number on the

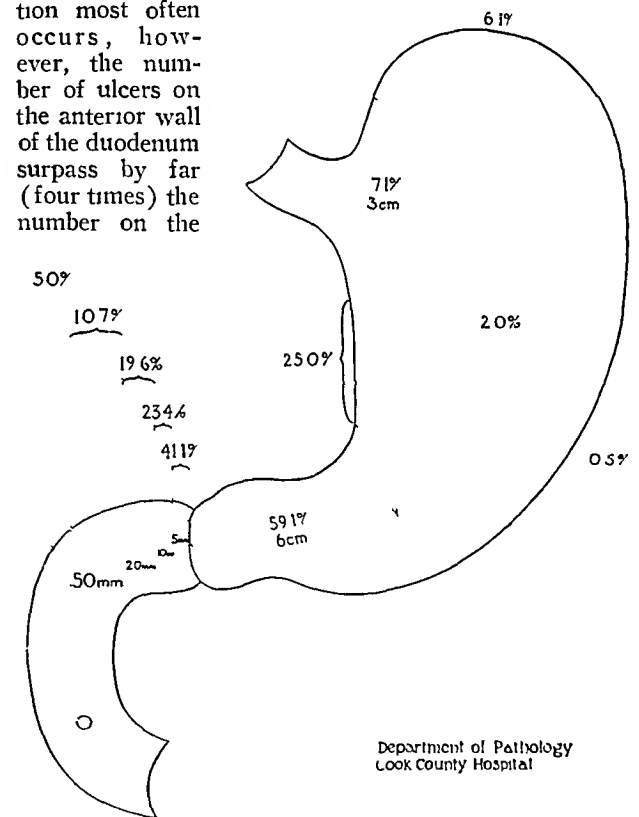


Fig. 3—Topographic distribution of 196 gastric and 158 duodenal ulcers

anterior wall of the stomach, so that this factor cannot be neglected. The factor of chronicity—and perforation most often occurs in chronic lesions—must again be emphasized as being more common in duodenal than in gastric ulcer, this was indicated previously in the consideration of acute versus chronic lesions and again in regard to the incidence of scars.

In a summary of all these data, it is found that the essential diagnosis of gastric ulcer was made in fifty-five cases, of duodenal ulcer in sixty-three cases and of jejunal ulcer in two cases. As an incidental lesion, 130 gastric and ninety-one duodenal ulcers were observed. Combined gastric and duodenal ulcers were observed in nineteen cases. Scars were associated with thirteen active ulcers, six gastric and seven duodenal. We had therefore a total of 240 gastric lesions and 215 duodenal lesions, which, with the 2 jejunal ulcers, makes a grand total of 457 peptic ulcers of all types observed in 9,171 autopsies, making an incidence of a little less than 5 per cent.

SUMMARY AND CONCLUSIONS

In a series of 9,171 consecutive necropsies performed at Cook County Hospital from Jan. 1, 1929, to Dec. 31, 1936, there were 457 cases of all types of peptic lesions, or a total incidence of about 5 per cent.

The incidence of peptic ulcer in white people was found to be 5.23 per cent and in Negroes 3.5 per cent. The incidence of peptic ulcer is greater in the white male than in the white female, the difference according to sex is not as marked in Negroes.

There was definite evidence of activity of the peptic ulcers in 339 necropsies. In 118 cases peptic ulcer was the essential lesion, in 221 it was the incidental lesion. Therefore, the incidental lesion was almost twice as frequent.

When peptic ulcer was the essential lesion the duodenal ulcer predominated, while when peptic ulcer was the incidental lesion the gastric ulcer predominated.

The peak for the incidence of peptic ulcer in the male is reached in the period from 51 to 60 years, the peak for the female is reached in the period from 31 to 40 years, while for the white female there is a second peak from 61 to 70 years.

Hemorrhage as a cause of death was observed in 0.43 per cent of all the necropsies and in 18.3 per cent in which peptic ulcer was seen as the essential lesion. Perforation was present in 20 per cent and stenosis in 7.5 per cent of all cases in which peptic ulcer was the essential lesion (120 cases). Therefore, more deaths were due to perforation than to hemorrhage in cases of peptic ulcer. Hemorrhage was observed most frequently in the stomach and perforation most frequently in the duodenum.

The peak of the incidence for peptic ulcer coincides with the age period accompanied by arteriosclerotic changes, when peptic ulcer is the incidental lesion it is most often associated with cardiovascular disease.

The predominance of scars and the examination of the tendency to acuteness and chronicity showed that gastric ulcer tends to be acute while duodenal ulcer tends to be chronic.

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ABSTRACT OF DISCUSSION

DR. SARA M. M. JORDAN, Boston. The subject of peptic ulcer will probably for many years have a great deal of fascination as a topic of discussion. The authors have made a contribution from the point of view of postmortem observations. These furnish data for certain aspects of the ulcer question which are important when correlated with observations in the living patient with ulcer. The final chapters in the life history of ulcer in this large number of patients have been shown. Experience has shown that the life history of ulcer ends only with the life history of the individual. These final chapters are therefore important. It is impossible to discuss all the points which the authors have brought out in this study. All physi-

cians are deeply concerned with the so called ulcer diathesis. The authors have stated that in this large group of patients 5 per cent had evidence of ulcer at their death. They believe that in order to determine the incidence of ulcer another 5 per cent could be added because, especially in young persons, the scar can be completely eradicated with healing. It may be assumed that 10 per cent of our living population have had an ulcer and therefore have an ulcer diathesis. A second point that was brought out was that an acute ulcer was found in the stomach and a chronic ulcer in the duodenum. These are familiar observations in the living patient. Patients are frequently seen who have an old, chronic duodenal ulcer and a new acute gastric ulcer, and the rapid disappearance of the gastric lesion is shown by x-ray and clinical examination. On examining such a stomach when a subsequent operation was done for another purpose I have sometimes had difficulty in finding the completely healed lesion on the gastric side, but the old scar of the duodenal lesion is still evident. This finding is nicely correlated with the authors' data. The third point which has been brought out is the fact that the most frequent location of the gastric lesion was in the prepyloric area. This is radically different from conditions found in the living, among whom the lesser curvature of the media is the location of the gastric lesion in about 60 per cent of the cases, and only about 25 per cent are found within 5 cm. of the pyloric ring. This discrepancy between the living and the dead may indicate that many of the patients in whom what was thought to be a precursor stage of ulcer, pyloric stenosis attributed to spasm, was found actually had a prepyloric ulcer which was not discernible by our methods of diagnosis and which later healed. This is an interesting fact because it is not in keeping with the apprehension that has been felt about prepyloric lesions.

DR. JOHN L. KANTOR, New York. The following figures, derived from private practice, show the incidence of ulcer as compared with other organic digestive diseases in 4,000 patients: (1) gallbladder disease, 307 cases (7.7 per cent), (2) duodenal ulcer, 296 cases (7.4 per cent), (3) gastric cancer, 85 cases (2.1 per cent), (4) colitis gravis, 59 cases (1.5 per cent), (5) gastric ulcer, 49 cases (1.2 per cent), (6) colonic cancer, 30 cases (0.7 per cent), (7) rectal cancer, 17 cases (0.4 per cent), (8) jejunal ulcer, 9 cases (0.2 per cent). This may therefore be taken to represent the natural incidence of ulcer disease as seen in the living patient. Next is shown the incidence of the various types of ulcer, and how overwhelmingly frequent the duodenal lesion is compared with the other locations: esophagus, 1 case (0.2 per cent), stomach, 49 cases (13.8 per cent), duodenum, 296 cases (83.3 per cent), jejunum, 9 cases (2.5 per cent), Meckel's diverticulum, 1 case (0.2 per cent). The autopsies of Drs. Portis and Jaffe show that gastric ulcer actually occurs in about the same frequency as duodenal ulcer. Obviously, there is a discrepancy between the autopsy figures and those of the clinic. What is the reason for this discrepancy? Perhaps it is that the gastric lesion is not so vocal as the duodenal lesion. It is a matter of reasonably common knowledge that the symptoms of duodenal ulcer are more likely to be sharply defined than those of gastric ulcer. The pain is more regular and so are the relief factors. It has for some time been my impression that gastric ulcer is more frequently encountered as a surprise finding either at roentgen study, operation or postmortem examination than is duodenal ulcer. Another possible reason for the difference is that an ulcer seldom kills a patient. Autopsy figures will therefore reveal all the patients who have had ulcer at any time in their lives, and hence the incidence, pathologically speaking, will be higher than it is clinically. Moreover, since some ulcers may heal without scars, the pathologic figures may even have to be increased to give the absolute incidence of ulcer disease. In order to show that ulcer seldom kills a patient, let me turn again to clinical experience. Known causes of death in 296 cases of duodenal ulcer were cardiovascular, 6, hemorrhage, 3, operation, 3, perforation, 2, carcinoma (gastric), 1, violence, 1. Known causes of death in 49 cases of gastric ulcer were operation, 4, carcinoma (in ulcer), 3, carcinoma (colon), 1, perforation, 1. In other words, only 16 of the 296 patients with duodenal ulcer were known to have died. Cardiovascular disease killed most of these and only 8 deaths could be attributed to the ulcer itself. Similarly only one of the patients with gastric ulcer died of the ulcer proper.

DR CLAYTON W GREFNE, Buffalo This is a valuable contribution from the pathologic point of view There is but little for one to add in the nature of discussion from the clinical point of view, after the splendid expressions from Dr Jordan and Dr Kantor There are two points to be kept in mind In general hospitals, particularly hospitals like the Cook County Hospital, there are a great many patients of the charity group and few of the "better class," but observations of this sort give slightly distorted views One is inclined to believe that patients of this sort constitute a higher group numerically than private patients with ulcer, those seen in office practice, who are still up and about, however, my experience at Buffalo is approximately the same as that suggested by Dr Portis and Dr Jaffe, about 5 per cent of the cases seen The age incidence in males they put as greatest between 51 and 60 In my group, including those who are living the decade before that would be the one in which are found the greater number of patients among men, 41 to 50 and it is true that in women the age incidence is a bit earlier than in men In general I think I can concur that acute ulcers in the stomach are more likely to be shorter lived, the patients lived but the ulcers disappeared, healing more quickly, and the longer continued cases of ulcer are nearly always in the duodenum I should like to agree also with the statement that peptic ulcer is a constitutional disease, an ulcer diathesis I shall look forward to later expression from the authors if they are able to break down their statistics and tell more about the patients' histories How many had operative measures? How many were under treatment? How many, as is so often the case in a general hospital, of this type have come in after long periods of self medication, seeking the advice of the hospital and a physician only when a catastrophe occurs?

DR GEORGE B EUSTERMANN, Rochester, Minn I want to point out that 7 per cent of all our proved duodenal ulcers at operation also have associated chronic gastric ulcer, and I should like to ask the authors about any bearing on that feature in their autopsy material Without exception the statistics based on necropsy show little difference between the incidence of gastric and duodenal lesions, although the disproportion is striking in clinical experience Our observations show that for every chronic gastric ulcer one sees at least ten duodenal ulcers, and three gastric carcinomas In Germany the disproportion between gastric and duodenal ulcers clinically is apparently not as great as in the North American continent and in England The older continental necropsy statistics revealed even a preponderance of gastric ulcers largely because the pathologists did not distinguish between pyloric and duodenal ulcer in my opinion I believe the more recent necropsy studies of Stewart and of Robertson and Hargis bring out the increasing incidence of duodenal ulcer as well as the healing or healed state of the "incidental" lesion It is reasonable to presume that the explanation for the consistent discrepancy between vital and post-mortem statistics with regard to incidence is largely due to the fact that duodenal lesions give rise more frequently to disturbances of sufficient degree to cause a patient to seek medical relief than do gastric lesions, and, secondly gastric lesions are likely to heal more readily and leave no trace of their previous existence This seems to be borne out by the authors' own fourth conclusion The comparatively high incidence of non-specific gastric and duodenal lesions in the Negro transplanted to a Northern industrial milieu, as pointed out recently by Steigmann and verified by the statistics presented herewith, is of direct clinical and etiologic significance Finally, the clinician, aware of the fact that many persons harbor healed, otherwise uncomplicated, lesions which may produce x-ray defects, must not be too quick to conclude that such lesions are active, especially in the presence of subclinical or atypical symptoms

DR RICHARD HERMANN JAFFÉ Chicago Our statistical study is based on the material of a charity hospital in a large city, and it is most likely that it does not give a true information as to the incidence of peptic lesions in the total population It is, however, worth mentioning that our data were collected during the years of depression, when many people of the so-called better classes were forced to look for treatment in a charity hospital who in better times would have gone to private hospitals I fully agree with the statement that in the majority of the cases the peptic ulcer is the local manifestation of an abnormal constitutional condition, that ulcer disease is con-

genital with the trend to run in families However, certain types of ulcer are strictly local alterations, as, for instance, the ulcers which result from vascular lesions (arteriosclerosis thrombosis, embolism, periarteritis of the gastric and duodenal arteries) As far as the scar formation is concerned, the characteristic stellate configuration is due to the fusion of the regenerating mucosa with the submucosa after the muscularis mucosae has been destroyed Scars following ulcers that have not broken through the muscularis mucosae are very difficult to recognize and may be easily overlooked Only from 1 to 2 per cent of the peptic ulcers of the stomach show microscopic evidences of malignant transformation of the regenerating glands I do not recall a single case of cancer of the duodenum that could have been traced to a peptic ulcer

DR SIDNEY A PORTIS, Chicago I am sure that many who work in the field of gastro-enterology were as surprised as I when we came to evaluate these statistics taken from the necropsy room Gastric and duodenal ulcer, from actual necropsies, are radically different from those observed in the roentgenologic and operating rooms An important part of this contribution is to impress on those who do not see ulcer to a large extent the great incidence of gastric lesions and the tendency for them to heal spontaneously These lesions may be very small and may be missed by the most astute roentgenologist That these gastric lesions actually exist, of course, there can be no question It was impossible in this survey to correlate the therapeutic considerations with the type and location of the ulcer It must be remembered that in a contribution of this sort one has to deal with the hard, cold facts evaluated at necropsy and that for teaching purposes we may have something to think about and discuss when we are talking about ulcer, not from the standpoint of what we think but actually what was really present, actually observed, in the necropsy room

THE CONTROL AND PREVENTION OF TRANSFUSION SYPHILIS

RESULTS OF A STATISTICAL SURVEY AND SUGGESTIONS FOR MORE ADEQUATE PROCEDURES FOR
DETECTION OF SYPHILIS IN ALL DONORS

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The increase in the employment of blood transfusion in recent years is responsible for the growing interest in problems connected with adequate protection of the recipient against infection with the donor's blood Today transfusions are administered much more frequently and in a greater number and variety of disease states than heretofore For example, in response to inquiries in several New York hospitals we have been informed that the number of transfusions has doubled during the past three years This is due partly to simplification of the technic, easier performance of the operation and increase in hospital facilities, and partly also to the added protection afforded the patient by a more careful selection of donors and the safeguards rendered by the more sensitive serologic tests for syphilis

NEED OF SAFEGUARDS TO PREVENT TRANSFUSION SYPHILIS

Fordyce¹ in 1915 reported Dade's case of transfusion syphilis, which is said to be the first published instance

From the Skin and Cancer Unit New York Post Graduate Medical School and Hospital of Columbia University

Read before the Section on Dermatology and Syphilology at the Eighty Eighth Annual Session of the American Medical Association Atlantic City, N J June 10 1937

¹ Fordyce J H Some Problems in the Pathology of Syphilis Am J N Sc 149 781-808 1915

of its kind. Although only sixty-eight proved cases of syphilis transmitted by blood transfusions have been recorded in the literature, the total number must obviously be much greater. It is common knowledge that the majority of such accidental infections are not reported.

The experiences of only a few of our colleagues demonstrate that the number of recorded instances of infection by donors falls far short of revealing the probable frequency of such accidents. We have been apprised of nineteen unreported cases in the practice of only four of our colleagues. But even accurate records would probably yield only a fraction of the actual number of instances of the transmission of syphilis by transfusion, for it must be borne in mind that many transfusions are administered to moribund patients who die so soon after one or several transfusions are given that it is impossible under ordinary conditions to know whether they have become infected.

TABLE 1—Survey on Control of Syphilis in Blood Donors
Based on Questionnaires Received from Sixty Hospitals
in New York City

	Percentage
Increase in number of transfusions in 1936 as compared to 1935	17.6
Sources of donors	
Professional donors	48.0
Volunteer donors	52.0
Serologic test on professional donors immediately prior to transfusion	
Blood tests for syphilis on all professional donors	90.0
Blood tests for syphilis whenever time allowed	3.0
Blood tests not done	77.0
Serologic tests on volunteer donors immediately prior to transfusion	
Blood tests on all volunteer donors	77.0
Blood tests not done	23.0
Time interval required by hospitals for blood tests on professional donors	
Once a year	2.0
Once every six months	10.0
Once every three months	7.0
Once every six weeks	2.0
Once a month	13.0
Depend on donor agency for control of syphilis	42.0
Made no statement regarding time interval	24.0
Clinical examination for syphilis immediately prior to transfusion	
Examined all donors for clinical evidence of syphilis	60.0
Examined volunteer donors only	13.0
Examined donors when time allowed	9.0
Did not examine any donors	18.0

with syphilis. As an example of such circumstances, one may cite patients with fatal pemphigus, to whom transfusions are frequently administered as a last resort.

Stokes² observed that syphilis transmitted by blood transfusion pursues the usual course of syphilis recognized in the secondary stage.

The most adequate serologic control of syphilis can best be accomplished by testing the donor's blood immediately prior to every transfusion. Lulled in a false security by the negative results of the relatively insensitive tests made at intervals varying from one month to six months, doctors might unknowingly utilize donors who had contracted syphilis. Furthermore, donors with a negative reaction to a serologic test on a previous examination have ample opportunity to acquire transmissible syphilis during the permitted time interval (from one to six months). This danger can easily be avoided.

The precautions and safeguards ordinarily employed to prevent transmission of syphilis by transfused blood

have not kept pace with the many improvements and refinements in the technic of transfusion. Recent publications in various parts of the world stress the inadequacy of the serologic control of donors. Untoward accidents or unforeseen difficulties which occur during transfusions ordinarily necessitate a delay or a cessation of the operation, usually with little or no serious ill effects on the recipient, on the other hand, after the inadvertent or accidental transfusion of blood from a syphilitic donor the operator is virtually powerless to prevent the development of the most unpleasant consequences.

The United States Public Health Service in cooperation with the American Society of Clinical Pathologists³ devised an evaluation plan to appraise the various modifications of the complement fixation and flocculation tests developed and used in the United States for the serodiagnosis of syphilis. The results of this evaluation showed that the more reliable flocculation tests were specific to the same degree and more sensitive than the complement fixation tests. The committee expressed the opinion that "certain tests which may be performed rapidly on blood specimens appeared to yield results comparable to those obtained with tests requiring a longer period for their performance."

The results of this recent serologic conference also made clear that certain tests are extremely desirable as diagnostic tests because of their high degree of specificity with satisfactory sensitivity, while others were desirable as exclusion tests, possessing maximum sensitivity and satisfactory specificity. The greater the degree of sensitivity inherent in a test, the larger will be the number of infected persons detected by such a test, provided that it possesses satisfactory specificity and that the results are properly interpreted.

Among the conclusions reached in this recent evaluation plan was the following:

There is some evidence that a properly performed highly sensitive flocculation test might be used routinely for the purpose of excluding the likelihood of syphilis. If a negative result is obtained by such a method, it is quite likely that it will be negative by any other method.

The Kline exclusion test is so highly sensitive that when the reaction is negative it usually excludes syphilis. In addition, it was shown in the results of this conference that the Kline exclusion test possesses satisfactory specificity,⁴ i. e., in a group comprising over 450 presumably nonsyphilitic persons this test gave less than 1 per cent false positive results. Furthermore, the test can be done in a few minutes with a small amount of blood from the finger. The Kline exclusion test is especially applicable for the detection of syphilis in donors because it possesses maximum sensitivity with satisfactory specificity and can be done in a few minutes with a few drops of easily collectable blood immediately prior to the transfusion.

Littman⁵ in 1932 reviewed 147,250 Kline tests performed in some sixteen clinics throughout the country and found the tests consistent with clinical observations in from 96 to 99 per cent of the cases. In addition he

3 Cummings H S and others. Evaluation of Serodiagnostic Tests for Syphilis in the United States. Ven Dis Inform 15: 387 (Dec) 1934. J A N A 103: 1705 (Dec 1) 1934. The Evaluation of Serodiagnostic Tests for Syphilis in the United States. Report of Results. Ven Dis Inform 16: 189 (June) 1935.

4 Rein C R. The Value of the Kline Exclusion Test in the Serodiagnosis of Syphilis. Results Based on the Evaluation of Serodiagnostic Tests for Syphilis in the United States. Am J Syph Gonorr Ven Dis 20: 205 (Sept.) 1936.

5 Littman Sidney. Clinical Evaluation of 147,250 Microscopic Slide Precipitation Tests for Syphilis. Urol & Cutan Rev 36: 245 (April) 1932.

found the Kline test to be more sensitive than the Kahn, Wassermann and Hinton tests in various stages and types of syphilis

INADEQUACY OF THE PRESENT REGULATIONS OF SEROLOGIC CONTROL OF BLOOD DONORS

The New York City Department of Health requires all professional donors to have serologic tests done once every six months. The various agencies supplying professional donors to hospitals and physicians usually require a blood test from once a month to once in three months. It is evident, however, that a donor may contract transmissible syphilis within the thirty day limit without exhibiting a chancre or any other clinical evidence of the disease. In many instances, especially in emergencies, these professional donors are not rechecked for syphilis serologically, or even clinically, immediately prior to transfusions. When volunteer donors, that is, relatives or friends of patients, are to be employed, serologic tests for syphilis are not required by law and may or may not be done. If, however, in each instance a highly sensitive blood test were made immediately before each blood transfusion, it would obviate the need for blood tests at stated intervals of professional and volunteer blood donors and would furnish much better protection to the patient.

The ideal procedure would be to perform a serologic test for the detection of syphilis on all professional and nonprofessional donors immediately prior to transfusion. The flocculation tests are especially applicable for this purpose because they possess a high degree of sensitivity and specificity, and, in addition, some of them can be done in a few minutes with a small amount of blood easily obtainable from a puncture in the finger.

COMPARATIVE MERITS OF CERTAIN TESTS FOR SYPHILIS

McNamara⁶ demonstrated that a syphilitic donor in the latent stage with a 4 plus Wassermann reaction may often be used without transmitting the disease to the recipient because spirochetes are absent from his blood. The practice of using such donors is of course to be condemned. On the other hand, the blood of a donor may give a negative reaction with a relatively insensitive test and the donor may still be affected with syphilis in an active stage and be capable of transmitting the disease to the recipient. It is during the first three months of the infection that the greatest danger of transmission exists, and it is in the early stage, immediately after the appearance of the chancre, that the insensitive tests may give negative results. It is important therefore to make use of the more sensitive tests (possessing satisfactory specificity) adequately to detect and control syphilis in blood donors.

THE NECESSITY FOR SENSITIVE FLOCCULATION TESTS BEFORE TRANSFUSION

Although blood donors may honestly state that they have never contracted syphilis, they may be affected with the disease through heredity. Furthermore, they may have extragenital and concealed chancres and remain totally unaware of their existence. In many instances, existence of the infection may be discovered only by a positive reaction to a serologic test. Hence the need for a thorough physical examination in addition to typing and matching of the blood and the more sensitive serologic tests.

Professional and volunteer blood donors, being liable to infection with syphilis either by sexual contact or otherwise during the intervals between donations, should all be subjected to a serologic test for syphilis immediately prior to blood transfusion, irrespective of the frequency of donations and the relationship of the recipient. (Perin and Lefevre⁷ reported the transmission of syphilis from mother to child by blood transfusion.) Blood donors' promises and assertions of sexual continence cannot be depended on and should not be taken seriously. The complement fixation tests are inadequate to cope with sudden emergencies requiring an immediate serologic examination, whereas the Kline flocculation tests (diagnostic and exclusion) can be performed more expeditiously than any other reliable test possessing a high degree of sensitivity and specificity, and they are more dependable in the detection of the disease in its earliest stages.

The following questionnaire was sent to 150 hospitals in New York City, and replies were received from 74.

Name of Hospital

Number of Hospital Beds

Number of Transfusions Given in 1935 and 1936

Telephone Number

Name of Pathologist

Donor Used

Professional donors (approximate number)

Do you have your own donor list?

Do you use outside private donor agencies?

Nonprofessional donors (relatives and friends, approximate number)

Serologic Examination for Syphilis

Are blood tests done immediately before transfusion on all donors?

If not, on what donors are tests done immediately before transfusion?

What type of blood test or tests are done on these donors?

How often are the professional donors you employ requested to report for blood tests?

Clinical Examination

Are all donors examined for clinical evidence of syphilis immediately prior to transfusions?

If not, which ones are given a complete physical examination?

Who makes this examination?

Routine for Blood Typing

Have you facilities to have a member of the laboratory staff on call at all hours of the day and night to perform typings and cross-agglutination?

If not, who is responsible for these tests in emergencies?

Do you know of any cases of transfusion syphilis in your hospital?

Do you feel that your present procedures are adequate?

Have you any suggestions for a more adequate detection of syphilis in professional and nonprofessional donors?

Of the seventy-four hospitals who answered the questionnaire, only sixty were equipped to do transfusions. These sixty hospitals, with a total capacity of 24,877 beds, did 10,609 transfusions in 1936, showing an increase of 17.6 per cent over the previous year. Although all depended on private blood donor agencies, a few also had their own list of professional donors. According to this statistical study, 48 per cent were professional donors, and the remainder (52 per cent) were volunteer donors.

Regarding the serologic control of syphilis in professional donors, the following facts were ascertained. Twenty per cent of the hospitals did blood tests on all professional donors immediately before the transfusion,

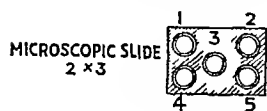
6 McNamara W. L. The Noninfectivity of the Blood in Tertiary Syphilis. *Am J Syph* 9: 470-478 (July) 1925.

7 Perin L. and Lefevre M. Transmission of Syphilis from Mother to Child by Transfusion. *Bull Soc franç de dermat et syph* 12: 251-257 (June) 1935.

and an additional 3 per cent did these tests whenever they had sufficient time. The remaining 77 per cent did not do any serologic tests for syphilis on professional donors.

Two per cent of the hospitals have their donors report for blood tests only once a year, while 10 per cent have their donors report to the board of health and are governed by their regulations (a blood test once every six months). Seven per cent insist on blood tests every three months and 2 per cent depend on blood tests every six weeks, while 13 per cent advise their donors to report for blood tests once a month. Forty-two per cent of the hospitals depend on the donor agencies to control the blood tests. The remaining 24 per cent made no statement regarding the serologic control of professional donors. In contrast to these statistics 77 per cent of the hospitals did blood tests on all volunteer donors immediately prior to transfusions.

TABLE 2—*Rapid Method of Typing Cross Matching and Detecting Syphilis in Blood Donors*



DONOR'S CELL SUSPENSION

- I Collection of blood by puncturing finger of donor
 - (A) 3 drops in test tube containing 1 cc of physiologic solution of sodium chloride for donor's cell suspension
 - (B) Collect finger blood in capillary pipet. Centrifuge and inactivate for heated serum test
- II Determine type of donor's cells and cross matching suitability
 - (A) Deliver 0.03 cc of donor's cell suspension into chambers I, II and III
 - (B) Add 1 drop of group A typing serum to chamber I. Add 1 drop of group B typing serum to chamber II. Add 1 drop of recipient's serum to chamber III
 - (C) Rotate one minute and read under microscope for determination of type and for cross matching suitability. Recheck readings at end of twenty minutes
- III Detection of syphilis
 - (A) Deliver 0.05 cc of donor's inactivated serum to chambers IV and V
 - (B) Deliver 1 drop (0.008 cc) diagnostic antigen emulsion to chamber IV and 1 drop exclusion antigen emulsion to chamber V
 - (C) Rotate four minutes and read with microscope

Sixty per cent of the hospitals examined all donors for clinical manifestations of syphilis prior to transfusions, while 13 per cent examined only the volunteer donors. Nine per cent examined the donors whenever they had sufficient time, while the remaining 18 per cent did not examine any donors clinically before the transfusion.

Ninety-two per cent of the hospitals had some one on call at all times in the laboratory to do blood typings and to determine suitability by cross-matching. These persons are, or can be trained, to do serologic tests for the detection of syphilis.

SUGGESTIONS FOR THE ADEQUATE CONTROL AND PREVENTION OF TRANSFUSION SYPHILIS

We suggest the following procedure, which can be done in thirty minutes immediately prior to all transfusions.

A Establish the blood group of all volunteer donors and regroup all professional donors.

B Determine the suitability of the donor's blood for the recipient by cross-matching.

C Detect the presence of syphilis serologically by means of the very sensitive and specific Kline diagnostic and exclusion flocculation tests.

D Detect any clinical evidence of syphilis by means of an adequate physical examination.

MATERIAL

Donor Serum—The donor's finger is cleansed with alcohol and sponged dry and a puncture wound made with a sharp needle. The bleeding finger is squeezed and the blood allowed to run into a capillary pipet (5½ inches [13 cm] in length and 3 mm in diameter) until it is two-thirds full (this will yield about 0.2 cc of serum, which is sufficient for the Kline diagnostic and exclusion tests). One end of the capillary pipet is sealed in the flame of a Bunsen burner, and the pipet is centrifuged for five minutes at high speed (about 2,000 revolutions per minute). This packs the cells and clots into the lower half, leaving the clear serum in the upper half. The entire contents of the capillary pipet are then inactivated in the water bath at 56 C for ten minutes. After this, the capillary pipet is filed and broken just above the level of the clot, and the serum is then allowed to run into, or is drawn into, a 1 cc pipet graduated in 0.01 cc.

Donor's Cell Suspension—Two or three drops of the donor's finger blood is collected in a test tube containing 1 cc of physiologic solution of sodium chloride.

Glassware—Microscopic slides 3 by 2 inches (7.6 by 5.1 cm), as purchased, are rubbed on both sides with a scouring paste (Bon Ami may be used, in which case the paste is prepared by breaking up a cake of Bon Ami in a small quantity of water). As soon as the paste is dry (in about five minutes), it is completely removed from the slide with a soft muslin cloth. On clean slides, five paraffin rings, each with an inside diameter of 14 mm, are mounted. These rings are made with hot paraffin wax by means of a thread wound wire loop with a 15 mm inside diameter.

Pipets—The pipets needed for delivering the serum and those for preparing the antigen emulsions are the ordinary finely graduated 0.2 to 10 cc pipet. The pipets for delivering the antigen emulsions are Wright pipets made from glass tubing from 6 to 10 mm in diameter, with the tapering ends of the tubes about 0.5 mm in outside diameter, for delivering a drop equal to about 0.008 cc (62 drops per 0.5 cc).

Kline Antigen and Antigen Emulsion—The antigen is a lipid obtained by precipitation in acetone at from 50 to 37 C of concentrated absolute alcohol extract of beef heart muscle powder (Difco). The details for the preparation of the Kline antigen and the antigen emulsions for the diagnostic and exclusion tests are given in Kline's book.⁸ Antigen kept at room temperature shows no appreciable change in specificity or sensitivity for at least six months. Antigen emulsions kept at room temperature are satisfactory for use up to forty-eight hours after preparation.

TECHNIC

1 Deliver 0.03 cc of the donor's cell suspension into rings 1, 2 and 3 on the slide.

2 Deliver 0.05 cc of the donor's inactivated serum into the remaining two rings.

3 Allow 1 drop (approximately 0.02 cc) of group A typing serum to fall into ring 1, a similar drop of group B typing serum into ring 2 and a similar drop of the recipient's serum into ring 3. One drop of the Kline diagnostic antigen emulsion (about 0.008 cc) is allowed to fall from a Wright's pipet into ring 4, and a similar drop of Kline exclusion antigen emulsion is added to ring 5.

4 The slide is then rotated on a flat surface for four minutes.

5 The results are read at once through the microscope at a magnification of about 120 times (low power 16 mm objective eyepiece 12) with the light cut down as for the study of urinary sediments.

The readings of the first two rings will establish the donor's group, the reading of the third ring will deter-

⁸ Standard Kline Antigen may be obtained from the LaMotte Chemical Products Company, McCormick Building, Baltimore.
⁹ Kline B. S. Microscopic Slide Precipitation Tests for Syphilis. Baltimore: Williams & Wilkins Company, 1932.

mine the suitability by cross-matching,¹⁰ and the results in the fourth and fifth rings will determine whether there is serologic evidence of syphilis

It might be preferable in some instances to set up the grouping and cross-matching first. If they are satis-

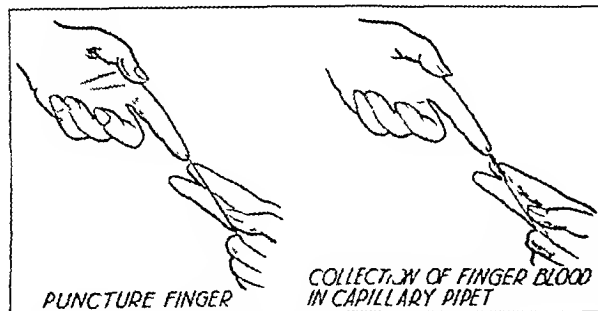


Fig 1—Method of taking blood in the finger blood test for syphilis

factory continue by centrifugating and heating the donor's serum at 56°C. While this process is being completed, the donor can be examined for any clinical evidence of syphilis. If the clinical examination is

Every hospital and institution in which blood transfusions are performed should have an adequate reserve of qualified blood donors for special emergencies. Hospital reserve donors may include interns, residents, nurses and orderlies. Their blood groups should be properly established and recorded for future reference and they should all be required to submit to blood tests prior to transfusion. One of these reserve donors can be called on if syphilis is detected in the professional donor just before transfusion.

Since a sufficient number of blood donors entirely free from syphilis is available in most localities, especially in larger communities, no blood donors with the least suspicion of being infected should be accepted despite McNamara's statement that blood showing a positive serologic reaction can be used for transfusion without infecting the recipient. A contingency may possibly arise in some isolated region that will necessitate an immediate blood transfusion irrespective of serologic results, but we are not concerned with such exceptional cases. However, there is the possibility of coping with even such an unusual circumstance by the quick delivery from a nearby source of 'canned

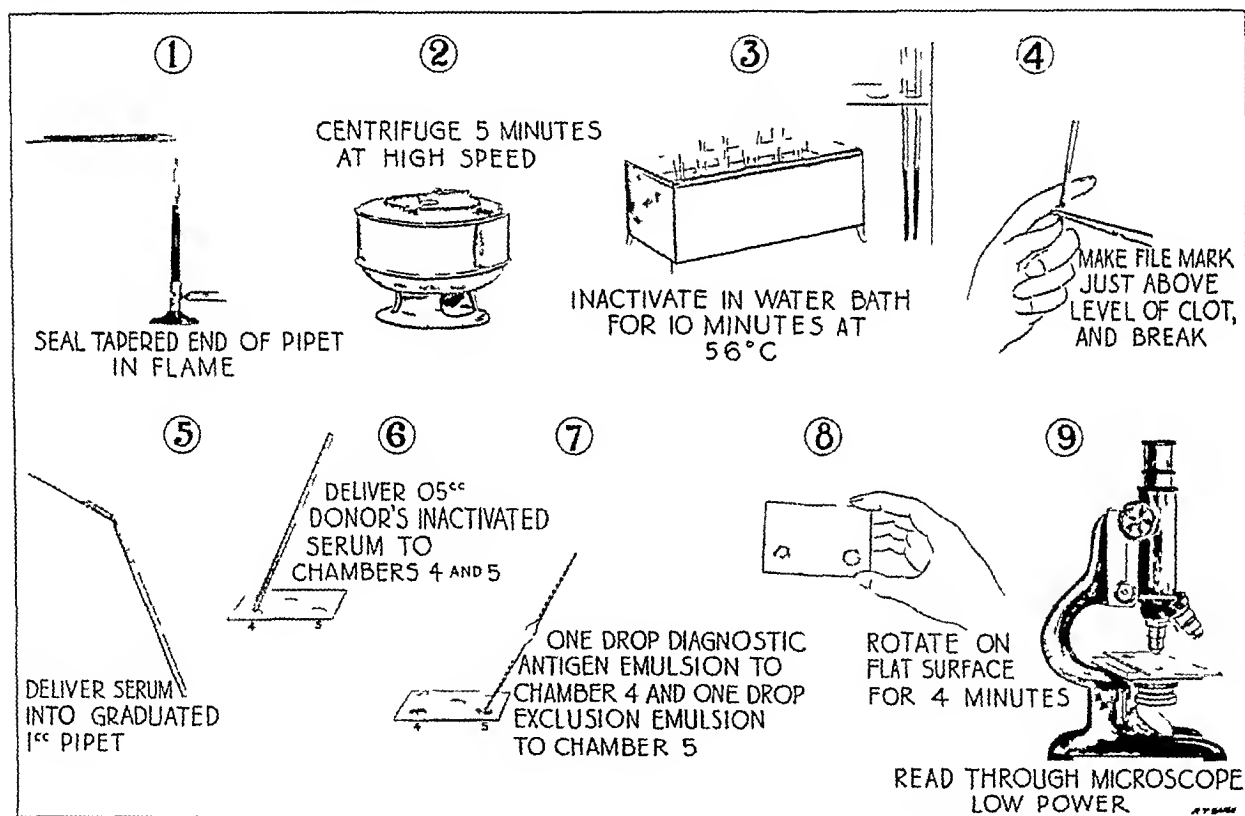


Fig 2—Finger blood test for syphilis

negative, carry out the serologic tests for syphilis on the same slide with the grouping and cross-matching. This makes possible the rechecking of the grouping and cross-matching and affords an added factor of safety.

10 This procedure is adequate if the selection of donors is rigidly restricted to those who have the same blood group as the recipient. In an occasional emergency, however, it may be necessary to make use of a universal donor. This procedure might not detect the so-called dangerous universal donor whose serum shows a high concentration of agglutinins and may cause clumping of the recipient's cells if the recipient's blood is of another group. To eliminate this possible danger the Coca compatibility test for direct matching should be employed for all universal donors. (Coca, A. F. The Examination of the Blood Preliminary to the Operation of Blood Transfusion. *J. Immunol.* 3: 93 [March] 1918).

blood¹¹ that has been properly typed and tested and stored for just such an emergency.

Furthermore, some of the larger donor agencies equipped to do blood tests on their donors at frequent intervals (three times a week) could supply recently tested seronegative donors to hospitals for special emergency transfusions when there was not sufficient time for blood tests immediately prior to the transfusions.

11 Ludin, S. S. Transfusion of Cadaver Blood. *J. A. M. A.* 106: 997-999 (March 21) 1936.

CONCLUSIONS

The responsibility of preventing transfusion syphilis rests with the physicians of hospitals and other institutions, both public and private, dedicated to the care of the sick. The control of donors under municipal supervision should be rigidly enforced.

With the adoption of the practice of carrying out blood tests on all donors immediately prior to transfusion, the periodic testing of the blood at predetermined intervals would become unnecessary. Even if professional donors are subjected to regular blood tests at monthly intervals, accidents cannot be wholly eliminated, for the danger of infection of the donor in the intervals between tests is a more than theoretical possibility.

A thoroughly reliable, rapid and easily performed blood test, if done on every donor immediately prior to transfusion, would practically eliminate all risk of infection of the recipient and would give the donor a clean bill of health at a time when serologic control is of paramount importance.

The Kline flocculation tests embody the desirable features of such serologic control because of ease and rapidity of performance, adequate specificity and high degree of sensitivity.

ABSTRACT OF DISCUSSION

DR HARRY L. BAEP, Pittsburgh. The most extreme emergency of selecting a donor without a proper serologic study is rare. The paucity of the literature in quoting sixty-eight cases of transfusion syphilis does not presuppose that a greater number of cases have not occurred. The United States Public Health Service, in cooperation with the American Society of Clinical Pathologists, has made a study and has evaluated the complement fixation tests and the various flocculation tests with a comparison of the specificity and sensitivity in the hands of the authors and of various laboratories. They have noted a marked discrepancy in the same laboratories and have advocated the better training of the personnel and standardization. If this condition exists among certain laboratories, it is reasonable to suppose that many patients with syphilis have been given a clean bill of health undeservedly. This committee expressed with comparable favor the rapid flocculation tests and the complement fixation tests and in fact favored the ruling out of syphilis when a highly sensitive flocculation test was negative. The authors' performance of the Kline test on 450 nonsyphilitic persons, which gave less than 1 per cent false positive, was reported in the comparable table of results and was less than any of the other tests. In the Kline test, Dr Rein and others have shown by their results a highly sensitive and specific serologic flocculation test for syphilis. With the question of transfusion Drs Rein, Wise and Cukerbaum have emphasized the absolute necessity of performing a serologic test prior to the procedure, and at their exhibit they show how easily and rapidly the typing, cross agglutination and serologic test can be performed. These procedures consume about half an hour, and during the interim the donor should be examined for present and healing lesions of primary and secondary syphilis. The objection one sometimes encounters from the professional donor of giving from 5 to 10 cc of blood for repeated Wassermann tests is overcome by using this or similar micro methods. I believe that this body should go on record as advocating, first the proper control of donors by performing a serologic test for syphilis prior to transfusion, second a complete physical examination at the time, third, the consideration and adoption of a rapid method or methods for serologic study, fourth, the proper control of the laboratories and personnel who are performing these tests.

DR I. W. KAHN, New York. It was my privilege during the years 1934 and 1935 to have supervision of all blood donors for the Department of Health in the City of New York. During that time I accumulated eleven cases of transfusion syphilis, none of which have been reported. Many of those persons have

started litigation against the hospital and also the doctor, and it will be interesting to see what happens when these cases come up in court in due process of time. Those who come from New York know that the health department requires that the donor be reexamined every six months, according to the sanitary code. He may be examined however, voluntarily, or at the request of the doctor or have another Wassermann test taken before this period elapses. This is purely optional. For a few years I have been trying to get legislation through to have the sanitary code amended so that a Wassermann test will be done every month. Even that is not sufficient, because the incubation period of syphilis is twenty-one days, and it may be negative on the first of the month and the individual have a chancre on the 21st or 22d. If Dr Rein and his co-workers proved everything they say, we shall not have to worry about the sanitary code and amending it. We can do the test immediately before the transfusion. Those of us who are doing public health work hail this new method with a good deal of enthusiasm.

GEORGE W. RAIZISS, PH.D., Philadelphia. An experimental study which my associates and I have made on rabbits infected with syphilis throws an interesting light on this problem. On the basis of our observations I may say that in rabbits—and rabbits have about the same course of syphilis as human beings—syphilis may be regarded as a spirochetal septicemia. We have found that a few minutes after a testicular inoculation the blood of rabbits shows the presence of *Spirochaeta pallida*. We did not use a serologic method but have taken the blood of the infected animals and inoculated it into the testicles of normal rabbits. The result was that, when the blood of animals infected five minutes previously was used, normal rabbits inoculated with it developed a syphilitic lesion six weeks later. The same result was obtained when the blood was taken fifteen minutes after inoculation, and one hour, five hours, twenty-four hours, forty-eight hours a week and at weekly intervals during the course of the first three months, thus showing the presence of *Spirochaeta pallida* in the blood of syphilitic rabbits. I therefore believe that, when a donor comes to give his blood for a transfusion, no serologic test is evidence of his blood being free of spirochetes, because if the exposure has occurred a few days before the blood is taken for a transfusion there is a possibility, according to this experimental study, that the blood contains spirochetes. Of course, this work has to be extended to patients in order to verify this point but I believe it is suggestive and should be followed further. Also, the view that in latent syphilis the blood stream is free of spirochetes needs verification. We have found that animals two or three years after a testicular inoculation, at times showed the presence of *Spirochaeta pallida* in the blood by the method which I have outlined.

DR HERMAN GOODMAN, New York. My comment is to report the routine positive Wassermann test of a series of persons who sought to become blood donors. This study included more than 2,000 white applicants, and I found the figures during a study of the prevalence of syphilis in New York City. The result of the blood study of the 2,000 applicants indicated 0.68 per cent positive. In other words, about two thirds of 1 per cent of more than 2,000 white adults were found to have positive serologic reactions. I did not hear any estimate of positive results from the other speakers. Of Negroes who sought to become blood donors, some 25 per cent were positive serologically. These two figures are important in any attempt to estimate the number of syphilitic persons in the general population. The usual figure given is that some 10 per cent of our population is syphilitic. I have offered two extremes: 0.68 per cent among white applicants for professional blood donors and some 25 per cent among the colored. Somewhere between is the ratio for adults in a large city of the United States. Two questions arise: What are the mathematical possibilities of the blood recipient having a positive blood serum reaction? What are the possibilities that both the donor and the recipient have positive blood serum reactions?

DR JOHN H. STOKES, Philadelphia. The tendency to use without adequate preliminary testing the blood of a relative or member of the family is one of the worst pitfalls in this transfusion situation. Syphilis is no respecter of family. In the

emphasis on serologic criteria it must never be forgotten that there are seronegative syphilitic persons who can transmit syphilis relatively small though their number may be. Accordingly the study of the donor, especially the professional donor, must be from every standpoint, including physical inspection at the time and even social observation and estimation. The damage suit is a great educator. Nothing will serve better (and with the howling popularity of syphilis at this time the figures will rise) than a judgment for a hundred thousand dollars against a careless medical man or surgeon who transmits syphilis by transfusion. This paper might better have been read before the Sections on Surgery and Practice of Medicine, because dermatologists have relatively little to do with and relatively little influence in the actual examination and testing that should precede transfusion. It should also be emphasized that principles such as those the authors have presented have equal application to all use of fresh biologic fluid. Convalescent serum for example, frequently comes from a member of the family who happens to be on the scene and it is promptly injected into the helpless usually young victim. Whenever a biologic fluid passes from person to person whether fresh or refrigerated (because *Spirochaeta pallida* can survive a considerable period of refrigeration), the described transfusion precautions should be closely followed.

DR CHARLES R REIN New York. The tests advocated in our procedure for the detection of syphilis in blood donors are not new. They were first described by Drs Kline and Young of Cleveland in 1926 and were later modified by Dr Kline. These tests have been used in many hospitals and laboratories during the past few years with excellent results. They have been employed for the detection of syphilis in all blood donors immediately prior to transfusion, at Mount Sinai Hospital, Cleveland, for many years, and Dr Reuben Strauss of that hospital has recently published a paper on this subject. Dr I W Kahn suggested that it might take considerable time to prove the adequacy of the Kline tests. I wish to call attention to the fact that Kline tests are not new and have been successfully employed for many years. In addition, the results of the three recent serologic conferences sponsored by the United States Public Health Service adequately prove the specificity and sensitivity of the Kline diagnostic and exclusion flocculation tests. The work of Dr Raziss suggests that there may be a very early invasion of the blood stream with spirochetes in human syphilis. Dr Stokes brought up some important points. I feel, however, that the importance of the term 'seronegative primary syphilis' has been unduly exaggerated. It is agreed that with the relatively insensitive complement fixation method the blood of patients would remain negative for about three weeks after the appearance of the chancre so that the seronegative stage with that particular test would be twenty one days. With the more sensitive flocculation procedures, that is, the Kahn standard and Kline diagnostic tests the blood becomes positive much sooner after the appearance of the primary lesion, so that the seronegative stage is shortened considerably. With the Kline exclusion test, syphilis may be detected within two or three days after the appearance of the chancre. There is sufficient experimental evidence on hand to support the fact that certain flocculation tests may be made so sensitive (and still possess adequate specificity) that they will detect serologic syphilis before the clinical appearance of the chancre. I believe, therefore that in discussing seronegative primary syphilis one should modify the term with the name of the test employed. A Wassermann seronegative primary is entirely different from a Kline seronegative primary. Dr Goodman is correct regarding the low incidence of syphilis in so called normal white persons. Dr Feldman and I made a survey of the incidence of syphilis in persons who were apparently healthy with the exception that they had to go to a dentist to have a tooth extracted. Kline tests were done with a few drops of blood easily collected from the bleeding socket immediately after the extraction. We examined more than 5,000 dental patients of which number only 2.06 per cent had syphilis. It was interesting to note that only 40 per cent of the patients with positive blood tests were aware of their infection and that 95 per cent were in the latent asymptomatic stage.

ROENTGEN THERAPY OF LOBAR PNEUMONIA

EUGENE V POWELL, M.D.

TEMPLE, TEXAS

In January 1933 I obtained from the physician in charge permission to try roentgen therapy on a patient who was ill with lobar pneumonia. Unable to find any references in the literature to guide me in dosage, I used a technic which had proved valuable in the treatment of carbuncles. However, I increased the filtration and skin-target distance, so as to irradiate more homogeneously the large mass of tissue that is involved in a consolidated pulmonary lobe. Within a few hours after the treatment the patient was relieved of much of his distress, and within twenty-four hours his tem-



Fig 1 (case 1)—A the lungs on the third day of pneumonia with consolidation in the midportion of the right lung. The sputum contained type III pneumococci. B the seventh day the pneumonia is rapidly resolving.

perature dropped by crisis. He then pursued an uneventful and complete convalescence.

I have since used roentgen radiation in 104 cases of acute lobar pneumonia and in thirty cases of bronchopneumonia. Only five of the patients with lobar pneumonia died, and those with bronchopneumonia showed a reduction in mortality from 30 per cent to 13 per cent. Several years ago the late Samuel Stern told me that roentgen therapy was being used in treating

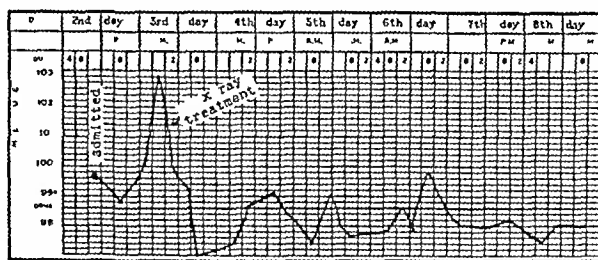


Fig 2 (case 1)—Temperature curve for the second to eighth days.

acute pneumonias in some of the European clinics and that in many cases of lobar pneumonia the crisis was developing within twenty-four hours after the treatment. A search, however, failed to show me any reports on the subject.¹ There are of course many references to the use of roentgen rays in treating unre-

From the Radiologic Department, King's Daughters Clinic. Read before the Section on Radiology at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1937.

¹ Since I presented this paper three more references have come to my attention as follows:

Heidenham L. and Friedl C. Roentgenography and Inflammation. *Arch f Klin Chir* 133: 639, 1924. Roentgen Rays and Inflammation. *Klin Wchnschr* 3: 1121, 1122 (June 17) 1924.

Friedl C. Artificial Pneumonia and Its Irradiation. *Strahlentherapie* 3: 430 (March 20) 1937.

solved pneumonias Musser in 1905 and Pemberton in 1907 are generally credited with the earliest reports on cases of delayed resolution.

For purpose of comparing some results it was at first my intention to use radiation therapy in alternate cases of pneumonia. This plan my staff would not permit me to continue, because it was soon noticed that patients who



Fig. 3 (case 2)—The lungs on the third day with consolidation in the right lower lobe. The sputum contained type II pneumococci and hemolytic streptococci. No follow up roentgenogram was obtained.

had received roentgen therapy were generally relieved of much of their respiratory and circulatory distress in a short while—occasionally within thirty minutes but more often within two or three hours—and it seemed inadvisable to permit the other patients to risk the effects of continued distress only for the sake of comparison. We have felt from early in

this work that the roentgen treatment would be justified on the score of the relief it gave even if the mortality had not been so materially reduced by it.

A year ago I made a preliminary report of our results. I showed a mortality of 25 per cent in forty-seven cases of pneumonia but because we had not typed the pneumococci and because I included a number of children in my review some critics said we had not proved that we had treated pneumonia. However, in seventy-six consecutive cases of pneumonia preceding the series I reported in which the diagnosis had been made in the same manner, twenty-two patients died.

Since then we have typed the pneumococci in all cases in which sputum could be obtained and have

pulse and respiration rates and pain localized to one portion of the chest, whose sputum is blood tinged and whose white blood cell count is 30,000 or more. The infection may be caused by the pneumococcus, streptococcus, staphylococcus or other organisms, and yet the physical and roentgen examination will indicate consolidation of one or more pulmonary lobes and the clinical course of the disease will be the same as that of pneumococcal infection.

I am more inclined to agree with Fried⁴ that pneumonia may be an allergic reaction by the lungs in response to an earlier sensitization. His observation that rabbits previously sensitized to horse serum will, when given a shocking dose of the serum intratracheally, acquire a condition grossly and histologically similar to pneumonia suggests that this view may be true. Also the clinical observation that very young children do not have lobar pneumonia unless their mothers have had the disease during the pregnancy resulting in their birth further indicates that sensitization may be a prerequisite to the pneumonic condition.

Since we started typing pneumococci by the Neufeld rabbit serum method we have had fifty-seven cases in which the condition was diagnosed clinically and roentgenologically as lobar pneumonia. Sputum was



Fig. 5 (case 3)—A the lungs sixteen hours after a chill with fixation of the diaphragm and beginning consolidation in the right lower lobe. The sputum contained pneumococci not type I, II or III. B the eighth day the lungs are almost clear.

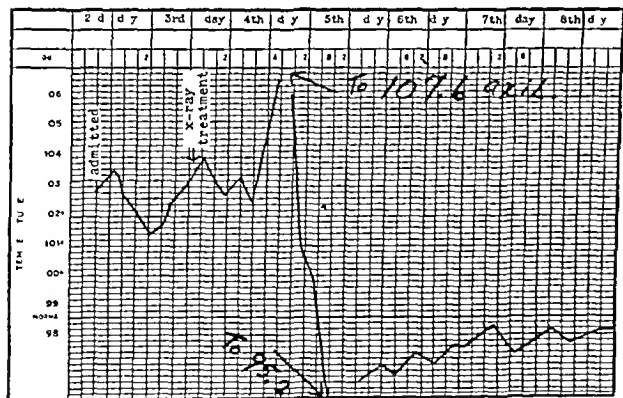


Fig. 4 (case 2)—Temperature curve for the second to eighth days.

studied roentgenologically all our patients before and after roentgen treatment. We do not agree with Rufus Cole³ that only acute pneumococcal infections of the lung should be called lobar pneumonia because one often sees patients whose onset of illness comes with a chill followed by fever of 102 to 105 F. increased

examined in forty-nine cases. In eleven the pneumococci were type I, in five type II and in six type III. In nineteen of the other twenty-seven cases the pneumococci were undifferentiated higher types, and in eight the infection was mixed bacteria other than pneumococci being isolated.

Two patients with type I pneumonia, to whom serum had been given before radiation, died, one death was due to pneumonia of a higher type and two to untyped pneumonia. Of special note perhaps is the fact that all of the patients with type II and type III pneumonia recovered.

It is difficult to estimate the effect of roentgen treatment on the complications of pneumonia. Seven patients had an empyema, necessitating drainage. One patient, known to have had tuberculosis and bronchiectasis before he had pneumonia, had a pulmonary abscess. He died four months after pneumonia developed and his death is included in the five deaths previously mentioned.

The technic I am using now remains essentially as I originally described it, that is from 250 to 350 roentgens of 0.3 angstrom unit of effective radiation (135 kilovolts with 3 mm. aluminum filter) is given

2. Powell E. V. Radiation Therapy of Lobar Pneumonia. Texa State Med J 32: 237 (July) 1936.
3. Cole Rufus. The Treatment of Pneumonia. Ann Int Med 10: 1 (July) 1936.

4. Fried B. M. Allergic Inflammation of the Lungs. Arch 14th 18: 862 (Dec) 1934.

anteriorly or posteriorly over an area a little larger than the involved portion of the lung

If the temperature and white blood cell count have not dropped to normal within thirty-six to forty-eight hours, a second roentgen treatment is given to an opposite field. Usually within two or three hours after the first treatment the patients report feeling much better. Clinically too, they look less sick. Within thirty-six hours, frequently during the first twelve hours, their temperature drops to normal. The pulse rate, the respiration rate and the white blood cell count drop also, but usually not quite so rapidly as the temperature. A secondary rise in temperature, not very high and lasting only a few hours, is not uncommon. It is only when the leukocyte count stays high or when the temperature remains elevated that the additional treatment is given. The resolution of the pulmonary consolidation practically always lags behind the other evidences of recovery, but this condition obtains in pneumonia regardless of the method of treatment. A few patients with pneumonia of mixed infection have received a third or fourth treatment. Successively smaller doses were of course given so as to avoid completely any cutaneous reactions.

Except in the treatment of three patients two of whom died, serum was not used in this series. Other routine medical treatment, however, was used, such as

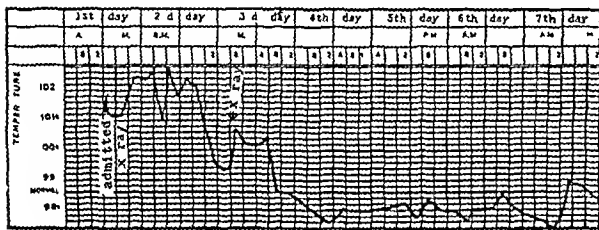


Fig 6 (case 3)—Temperature curve for the first seven days

the administration of morphine when necessary for rest, of digitalis only when there was evidence of cardiac decompensation and of oxygen for cyanosis. Metrazol was used in a few cases as a respiratory stimulant.

Bronchopneumonia seems to me to be more variable and as a whole less favorably influenced than lobar pneumonia. However, McIntire and Smith⁵ recently reported that if patients with bronchopneumonia are treated during the first three or four days with diathermy and then are given roentgen therapy they respond as well as do patients with lobar pneumonia. This may be true because we have noted that if patients with lobar pneumonia are treated with roentgen rays during the stage of congestion—that is, before consolidation can be demonstrated roentgenographically—the disease may spread and the patient recover more slowly. Another interesting observation of theirs is that patients with a mixed infection frequently show a prompt response followed by a secondary rise in temperature a few days later. After a second or third roentgen treatment these patients generally return to normal and remain so. A recheck of our records seems to bear this out.

There is no definitely proved explanation as to why patients with pneumonia respond as favorably as they do to roentgen treatment but the improvement seems to be associated with the destruction of the infiltrating

leukocytes. This process may release the antibodies required to combat the infection. Because so many acute infections and so many inflammatory reactions respond satisfactorily to roentgen therapy it seems reasonable to believe that something common to all of these lesions is favorably affected by roentgen rays. The possible increased permeability of the bacteria

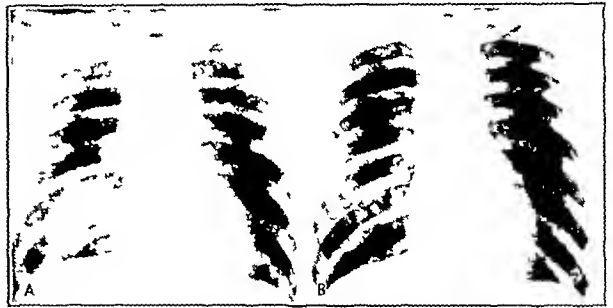


Fig 7 (case 4)—A the lungs on the second day of pneumonia with consolidation chiefly in the right lower lobe. The sputum contained pneumococci not type I II III. B the ninth day the lungs are almost clear.

themselves may also be a reason for the favorable reaction. But whatever may be the actual cause we know that many patients react as though they had been given some highly potent and specific therapeutic agent instead of roentgen radiation.

We have tried to determine whether there is evidence of increased immune substances in the blood serum during the time of clinical improvement. So far the observations have been inconclusive. When more data have been collected, J. E. Robinson, our pathologist, hopes to report them.

The following histories with reproductions of roentgenograms, are presented to illustrate the response. Though in our series patients of all ages from 2 years to 70 were treated only histories of adult patients are presented here, because childhood pneumonia is so variable.

CASE 1—A white woman, aged 68, had had a severe cold for nearly two weeks. Forty-eight hours before admission to the hospital she was awakened with a chill and coughed up blood-tinged sputum. She had a pain in her right axilla and her temperature went up to 105 F. On admission to the hospital her temperature was 99.8 F (she had been given some

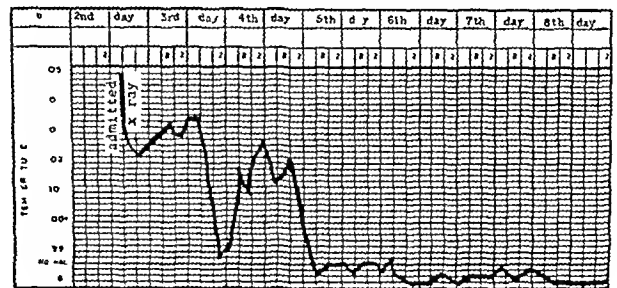


Fig 8 (case 4)—Temperature curve for the second to eighth days

acetylsalicylic acid) but rose to 103 F during the next twelve hours. On admission her white blood cell count was 26,300 with 90 per cent polymorphonuclears and with a nuclear index of 2. Her sputum showed type III pneumococci. Roentgen treatment was given the following morning. That afternoon her temperature dropped to 97 F and it varied from 97 to 99 F during the eight more days the patient remained in the hospital.

CASE 2—A white man, aged 44 had a chill with the temperature up to 104 F, rusty sputum and pain in the right side of the chest during thirty-six hours before admission to the

⁵ McIntire, F. T. and Smith, J. H.: X-Ray Therapy of Pneumonia. *Texas State J. Med.* 33: 422 (Oct.) 1937.

hospital. On admission the sputum showed type II pneumococci and hemolytic streptococci. Radiographic examination showed consolidation of the right lower lobe. Roentgen treatment was given on the third day of illness. Twenty-three hours later and after a blood transfusion the axillary temperature rose to 107.6 F. This rise was followed during the next twelve hours by a drop to 95.2 F. The patient's temperature did not rise to normal for three days. He left the hospital after one week and had an uneventful and complete recovery.

CASE 3—A white man, aged 36, who weighed 245 pounds (111 Kg.), sixteen hours before admission had a chill, followed by a temperature of 103 F and pain in the right lower part of the chest. On admission he had a white cell count of 26,000 with 90 per cent polymorphonuclears and a nuclear index of 6.5. The sputum showed pneumococci not types I, II or III. Roentgen treatment was given on admission and repeated two days later. Temperature dropped to normal or below it on the third day of the disease. An uneventful convalescence followed. The patient remained in the hospital for ten days. On discharge his white cell count was 7,000, with 68 per cent polymorphonuclears, and he was clinically well.

CASE 4—A white youth, aged 17, was taken ill about thirty hours before admission to the hospital with pain in the right side of the chest, fever and cough. Twenty-four hours after the onset he raised blood tinged sputum. On admission he had a temperature of 101.4 F, the pulse rate was 124 and the respiration rate 28. The white cell count was 23,700, with 93 per cent polymorphonuclears and a nuclear index of 1.2. The sputum showed pneumococci not types I, II or III. A roentgen treatment was given two hours after admission. Twenty-four hours later the temperature dropped to 98.8 F, but it rose again to 102 F that day. Ninety-six hours after the onset it was 98 F, and it remained normal or below during the rest of the stay in the hospital. The white cell count on the fifth day was 7,000, with 92 per cent polymorphonuclears.

CASE 5—A white man aged 50, had had a cold for about a week. Two days before admission to the hospital he had a chill, the temperature went up to 104 F, and there was pain in the right side of the chest. On admission his temperature was 104 F, his pulse rate 135 and his respiration rate 32. The white cells numbered 18,500, and 84 per cent were polymorphonuclears. The nuclear index was 2. Blood-tinged sputum the day after admission showed a general mixed infection, with type I pneumococci present. Roentgen treatment was given

mococci and other bacteria. Only five of the patients have died, this gives a mortality of just under 5 per cent.

Our results in the treatment of type I infections seem to have been better when we used roentgen therapy than when we used serum. Because of the varying reports of its value we have not used serum in treating other than type I pneumonias. Whatever the reason for the beneficial effect may be, wide experience has shown that roentgen therapy of carbuncles, furuncles and many other acute infections is probably the method of choice. We believe that roentgen therapy should be

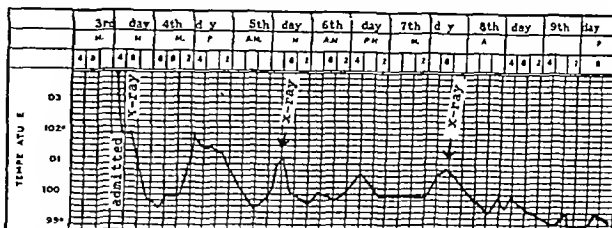


Fig. 10 (case 5)—Temperature curve for the third to ninth days. Roentgen treatments were given the third fifth and seventh days.

the preferred method in the treatment of pneumonias. So far the only contraindication seems to be definite leukopenia such as is encountered occasionally in patients with postinfluenza pneumonia.

304 South Twenty-Second Street

ABSTRACT OF DISCUSSION

DR. FRED M. HODGES, Richmond, Va. At first I was inclined to be critical of Dr. Powell's work on pneumonia. After seeing his enthusiasm and the good work he is doing I am about convinced that if I had pneumonia I would want roentgen therapy in addition to other treatment. The mortality in lobar pneumonia is so extremely variable in different series of cases and in different years that this makes it difficult to evaluate properly any method of therapy. For instance, the mortality throughout the country this past year has been low regardless of the treatment. It requires a large number of cases spread over several years to obtain more or less reliable statistics. Observers in different parts of the country report from 30 to 66 per cent of cases of lobar pneumonia as amenable to serum therapy. In one recent report of forty-six cases of type I lobar pneumonia there was no mortality. In another similar group the mortality was 12 per cent and in other groups from equally good clinics the mortality has been higher. Probably about 50 per cent of lobar pneumonias have no specific therapy today and in this group, especially, roentgen treatment should be tried. Except for the destruction of some of the infiltrating leukocytes no one knows exactly what happens following irradiation of inflamed tissues, but it is known conclusively that there is a very pronounced clinical effect. There should theoretically be a marked effect on the type of pathologic condition present in lobar pneumonia, since as in other infections, the greater the amount of leukocytic infiltration the better the result. Dr. Powell by having films before and after treatment along with the clinical and laboratory observations has done what is essential if the efficacy of roentgen treatment in this condition is to be proved. Statistics on lobar pneumonia should not as a rule be accepted unless the diagnosis has been confirmed by positive evidence on the film. Until a larger number of cases have been treated I am going very slowly into this field, but I am going to treat some cases especially those not amenable to serum therapy. The treatment of so many infections by the roentgen ray is on solid ground today, and physicians must be very careful not to jeopardize this by making any claims that cannot be proved by a large series of well worked up cases. Dr. Powell has certainly had a very low mortality, apparently has shortened the course of the disease and has given his patients a great deal of physical comfort.

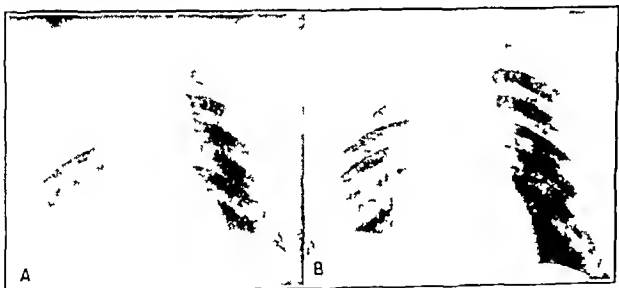


Fig. 9 (case 5)—A the lungs on the day of admission, the third day of pneumonia with consolidation in the right upper and middle lobes. The sputum showed a mixed infection with type I pneumococci. B the eighth day resolution is almost complete.

on admission and repeated on the fifth and seventh days. After the first treatment there was a sharp drop in the temperature to 99.6 F, followed by a rise to 102 F. The temperature returned to normal by 10 A.M. and the patient was dismissed from the hospital in ten days. A roentgenogram made on the fifth day showed about 50 per cent resolution as compared with the roentgenogram made on admission.

SUMMARY

During the last four and a half years we have used roentgen therapy in 104 cases of lobar pneumonia, including cases of infection due to types I, II and III pneumococci, as well as to the higher types of pneu-

CHRONIC ROENTGEN AND RADIUM
DERMATITIS

AN ANALYSIS OF 259 CASES

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This is an analysis of 259 cases of chronic radiodermatitis seen in the Section on Dermatology and Syphilology at the Mayo Clinic in the period from 1930 to 1934 inclusive. Only cases of late injury, as determined by the clinical signs, were chosen, all cases of immediate or early injury from radium or roentgen therapy being excluded.

A distinction is not made in this study between patients who received but one massive dose of roentgen rays or radium and those whose roentgen dermatitis followed smaller doses or repeated exposures such as occurred, for example, in physicians. Many of the patients in this series came to the clinic primarily because of the injury to the skin, in other cases the cutaneous condition was of minor importance or of no concern to the patient. This study therefore includes patients with all degrees of chronic radiodermatitis and is not limited to those with the severe effects only. The cases have been divided into two groups: (1) those in which malignant changes had not as yet appeared when the patient was first seen, and (2) those in which the injury to the skin had already resulted in malignant change. Cases of cutaneous epithelioma in which treatment was by roentgen rays or radium were also omitted from the study.

The clinical diagnostic features of radiodermatitis are of course well known. Telangiectasia develops most frequently after second and third degree reactions, it sometimes appears within a few weeks or months but usually appears in about a year's time. Atrophy of the skin always follows second and third degree reactions and, occasionally, those of the first degree also. Pigmentation commonly develops even after the mildest type of reaction and, while it frequently disappears after a short interval, it may persist for many years and may even become permanent. Pigmentation is due to deposits of melanin in the epidermis and cutis.

Severe reactions may result in areas of depigmentation instead of hyperpigmentation. Permanent loss of hair follows reactions of the second and third degree. Diminution in the secretory function of the sweat glands is noted after first and second degree reactions or after repeated suberythema doses. Dermal appendages, including the sebaceous glands and hair follicles, are completely destroyed by third degree reactions. Injuries to nails result in longitudinal or transverse ridges, in the case of severe injuries there is loss of the nail, although it will usually grow again. Keratoses tend to develop on an atrophic and telangiectatic skin, and they appear first several years after the initial injury. Ulcers appearing during the course of an acute, severe reaction may persist as such, ulcers may first develop, however, many years later from a dry, atrophic, telangiectatic skin or result from

the breaking down of keratoses. Such ulcers tend to persist and prove recalcitrant to treatment.

Various interesting classifications of radium and roentgen dermatitis have been given by Porter,¹ by Gillies and McIndoe,² by Miescher³ and by Wise and Sulzberger.⁴ The most satisfactory classification, in our opinion, is one based on the extent of the injury. The cases in this series were divided according to three degrees of injury. Injuries of the first degree consisted of the cutaneous changes of atrophy, sclerosis, telangiectasia, pigmentation, alopecia and diminished sweat and sebaceous function—any, several, or all of these but without evidence of keratoses or ulcers. Injuries of the second degree comprised any or all the changes of the first degree plus the presence of small ulcers (from a few millimeters up to 7.5 cm in diameter) or numerous keratoses. Injuries of the



Fig 1.—Extensive first degree injury in the case of a man who had received roentgen treatments for hypertrichosis. Note atrophy, telangiectasia and pigmentation. No keratoses or ulcerations are present.

third or most severe degree were injuries presenting the features just mentioned for the other two degrees, plus the presence of large ulcers (more than 7.5 cm in diameter). It will be shown that the greater the degree of injury the more frequent were the severe complications. An analysis of the 259 cases according to the degree of involvement revealed that 48 per cent of the injuries (124) were of the first degree, 44 per cent (115) were of the second degree and 8 per cent (twenty) were of the third degree.

From the Section on Dermatology and Syphilology, the Mayo Clinic. Abstracts with additions of thesis submitted by Dr. Saunders to the Faculty of the Graduate School of the University of Minnesota in partial fulfillment of the requirements for the degree of M.S. in Dermatology and Syphilology.

1 (a) Porter C A. The Surgical Treatment of X-Ray Carcinoma and Other Severe X-Ray Lesions Based upon an Analysis of Forty Seven Cases. *J. M. Res.* 21: 357-413 (Sept.) 1909. (b) Surgical Treatment of Roentgen Ray Lesions. *Am. J. Roentgenol.* 15: 31-37 (Jan.) 1925.

2 Gillies H D and McIndoe A H. Plastic Surgery in Chronic Radiodermatitis and Radionecrosis. *Brit. J. Radiol.* 6: 132-147 (Feb.) 1933. Role of Plastic Surgery in Burns Due to Roentgen Rays and Radium. *Ann. Surg.* 101: 979-996 (April) 1935.

3 Miescher C. Zur Klinik und Pathogenese der Röntgenspät-schädigungen der Haut. *Schweiz. med. Wchnschr.* 56: 1111-1118 (Dec. 3) 1925.

4 Wise Fred and Sulzberger M B. Year Book of Dermatology. Chicago Year Book Publishers 1935.

A study of the relation to sex and occupation revealed nothing of significance except that twenty-six (or 10 per cent) of the patients were physicians and dentists who had been exposed to radium or roentgen rays in their occupation. This is in contrast to Cod-



Fig. 2—Extensive third degree injury with epitheliomatous changes following roentgen therapy for a granuloma that probably was a gumma.

man's⁵ figure, in his paper published in 1902, of 30 per cent for cases of chronic roentgen dermatitis among physicians and technicians. Except for a high incidence of involvement of the hands in this occupational (professional) group, a survey of our series of cases according to the location of the injury did not reveal any particular areas of predilection. The hands were involved in seventy-eight cases (including the twenty-six just mentioned) the trunk in fifty-one, the face in thirty-two, the feet in twenty-four, the neck in twenty-two, the lower extremities in nineteen, the upper extremities in nineteen and the genitalia in fourteen.

The latent period was considered to be the time from the last exposure to irradiation to the first development of cutaneous changes. Late phenomena appear months and even years after the initial injury. In this series the average latent period was 4.8 years for first degree injuries, 4.2 years for second degree injuries and 1.8 years for injuries of the third degree.

A study of the distribution of the ulcers and keratoses revealed the hands to be predominantly involved. Senile changes in the skin apparently played no part in the production of roentgen keratoses, as relatively few keratoses were seen on the face, the common site for senile changes and senile keratoses.

A significant fact revealed by this study was that, except for physicians and dentists who were exposed to radium or roentgen rays in the course of their occupation, thirty-three (14 per cent) of the patients received their injuries while undergoing radiotherapy.

for malignant diseases (other than cutaneous epithelioma), whereas 200 (86 per cent) had been treated for miscellaneous benign conditions. The table enumerates these benign dermatoses the irradiation of which resulted in injury. One hundred and eighty-one of these 200 patients (90 per cent) were therefore treated for benign dermatoses whereas the remaining 10 per cent were treated for nondermatologic conditions. This large incidence of injuries among dermatologic patients attests the immense popularity roentgen rays has achieved in the treatment of skin conditions, both within and without the specialty.

In the accompanying table it will be seen that radiotherapy was used frequently for dermatoses that tend to recur—a fact which usually makes them unsuitable

Benign Dermatoses Which Had Been Treated by Irradiation

	Cases
Eczema	27
Trichophytosis	14
Pruritus ani	12
Hypertrichosis	10
Psoriasis	10
Neurodermatitis	9
Pruritus vulvae	8
Acne and lupus vulgaris	7*
Nevi and occupational dermatoses	6*
Allergic dermatoses	4*
scrofuloderma	
stasis dermatitis	
Arsenical keratosis	
atrophy of the nails	
chilblains	
eczematoid dermatitis	
herpes simplex	
hyperhidrosis	
keloid	
keratoderma	
melanoma	
morphea	
papilloma	
verruca senilis (seborrheic warts)	
secondary syphilis	
senile keratosis	
tuberculosis	
verrucosa	
verruca	
plantaris and verruca vulgaris	1*
Carbuncle	2

* Each

for radiation therapy, examples of such dermatoses are trichophytoses, pruritus ani and pruritus vulvae, and psoriasis. Despite the value of radiotherapy for certain types of eczema and neurodermatitis the need for caution in the treatment of these conditions cannot be emphasized too strongly. It will be seen that radio-



Fig. 3—Second degree injury of two and a half years duration following treatment by roentgen rays for an occupational eczema. Note the changes in the nails. Squamous cell epithelioma, grades 2 and 4 were present. The left ring finger was amputated.

therapy was sometimes used also in the treatment of conditions in which vascular damage was already present as a part of the dermatitis (chilblains and stasis dermatitis), in which atrophy was present (morphea and atrophy of the nails), and finally in conditions clinically and histologically resembling roentgen keratosis (arsenical and senile keratoses).

⁵ Codman, E. A. A Study of the Cases of Accidental X-Ray Burns Hitherto Recorded. Philadelphia, 1902. 38-442 (March 8) 1902.

The roentgen treatment of hypertrichosis has been condemned for a great many years and the fact needs only to be mentioned.⁶ Further analysis of the group which had received treatment for dermatologic and other conditions revealed that 50 per cent of the patients had received moderately severe to severe second and third degree injuries (figs 1-5)



Fig. 4—A second degree injury following treatment of eczema by roentgen rays. Note lymphedema, hyperpigmentation, keratosis and ulcerations.

The etiology of chronic roentgen or radium dermatitis is complicated and involves not only the question of idiosyncrasy to the rays but more especially increased sensitivity to radiotherapy following the improper use of stimulating medication locally in conjunction with radiotherapy. Hazen,⁸ in a report of a series of 111 cases of late injuries to the skin has recently discussed the various factors in and causes for radiodermatitis, his series included thirteen cases in which radiodermatitis resulted from treatments received in a 'beauty shop'. In one case in this series malignant changes with ultimately fatal termination resulted from roentgen treatments given by a worker in such a shop.

ROENTGEN AND RADIUM EPITHELIOMA

Twenty-seven, or approximately 10 per cent, of the patients in this series developed squamous cell epitheliomas at the site of the roentgen or radium dermatitis. This percentage, however, would have undoubtedly been higher if a group of patients whose injuries were of longer duration had been taken. Furthermore, if patients with first degree injuries are eliminated, it will be found that 19 per cent of the patients in this series with second and third degree injuries developed epitheliomas. The ages of these patients ranged from 27 to 67 years, the average age being 49½ years. Twenty of the patients were men, the remaining seven were women. Nine of the patients were physicians who gave roentgen treatments.

(Cole H. N. Chronic Roentgen Ray Dermatoses as Seen in the Professional Man. J. A. M. A. 84: 865-873 (March 21) 1925.
7 Desjardins A. U. and Smith F. L. Radiodermatitis and Its Treatment. S. Clin. North America 1: 479-493 (April) 1924. Groedel F. M. and Lossen Heinz. Die indirekten Röntgenverbrennungen (Verbrennungen durch Kumulation und Kombination). Klin. Wochenschr. 7: 2383-2386 (Dec. 9) 1928. Mackee G. W. X-Rays and Radium in the Treatment of Diseases of the Skin, ed. 2. Philadelphia: Lea & Febiger 1927. Pohle E. A. and Wright C. S. Studies of the Roentgen Erythema of the Human Skin. Radiology 14: 351-363 (April) 1930. Zugsmith G. S. Roentgen Ray Burns with Report of Nine Cases from University Hospital Philadelphia 1907 to 1933. Radiology 23: 36-44 (July) 1934.

8 Hazen H. H. The Cause and Prevention of Radiodermatitis. J. A. M. A. 97: 1881-1885 (Dec. 19) 1931.

In fifteen cases the epithelioma had resulted from the treatment of some benign condition in thirteen cases a benign dermatosis, in one case it had resulted from fluoroscopic examination and in the remaining case from treatment of a preexisting malignant growth in the uterus. As was previously found, analysis of these thirteen cases of benign dermatoses in which epithelioma developed in the roentgen dermatitis showed that in most cases the condition was of the chronic recurring type or that for which radiation therapy gives only temporary relief. There were in this group for example three cases of eczema two each of trichophytosis and occupational dermatitis and one each of acne, hypertrichosis, syphilis, neurodermatitis, psoriasis and pruritus vulvae.

In ten cases in this group the time from the initial exposure to roentgen rays to the production of damage varied from one-half to eighteen years. Hesse⁹ has reported the time from exposure to the development of epithelioma as varying from four to fourteen years with an average of nine years and the time from the appearance of the first signs of roentgen damage to the production of epithelioma from one to eleven years (the average being seven and a quarter years). In nine cases this time relationship¹⁰ varied from two to twenty years. A long latent period is well recognized and must be taken into consideration when a prognosis is given regarding the future development of epithelioma in any roentgen dermatosis. The question of coincidental epithelioma can be ruled out by the concomitant manifestations.

Following Broders¹¹ method of grading seven of these lesions were of grade 1, nine were of grade 2, four were of grade 3, and two were of grade 4 (the



Fig. 5—Exfoliation of the nails of a nurse following a first degree dermatitis from handling radium.

most severe degree of malignancy). Multiple squamous cell epitheliomas of grades 1, 2 and 3 were present in one case, and of grades 2 and 4 in one case. Three extensive large epitheliomas were not subjected

9 Hesse O. Symptomatology, Pathogenesis and Therapy des Röntgenkarzinoms. Leipzig: J. A. Barth 1911.

10 Colwell H. A. and Russ Sidney. X-Ray and Radium Injuries: Prevention and Treatment. London: Oxford University Press 1934. Porter J.

11 Broders A. C. The Grading of Cancer: Its Relationship to Metastasis and Prognosis. Texas State J. Med. 20: 520-525 (Dec.) 1933.

to biopsy or graded. The more malignant grades of epithelioma tended to occur in the most heavily damaged skins, namely, in those clinically with second and third degree injuries. The fact that in eight of these twenty-seven cases lesions were grade 3 or 4 squamous cell epitheliomas is indicative of the fact that a serious prognosis must be offered in some cases of chronic radiodermatitis in which there are epitheliomatous changes.

In this group, epithelioma occurred most frequently on the backs of the hands, which is explained by the relatively large number of physicians in the group. Two of the twenty-seven patients in the group had

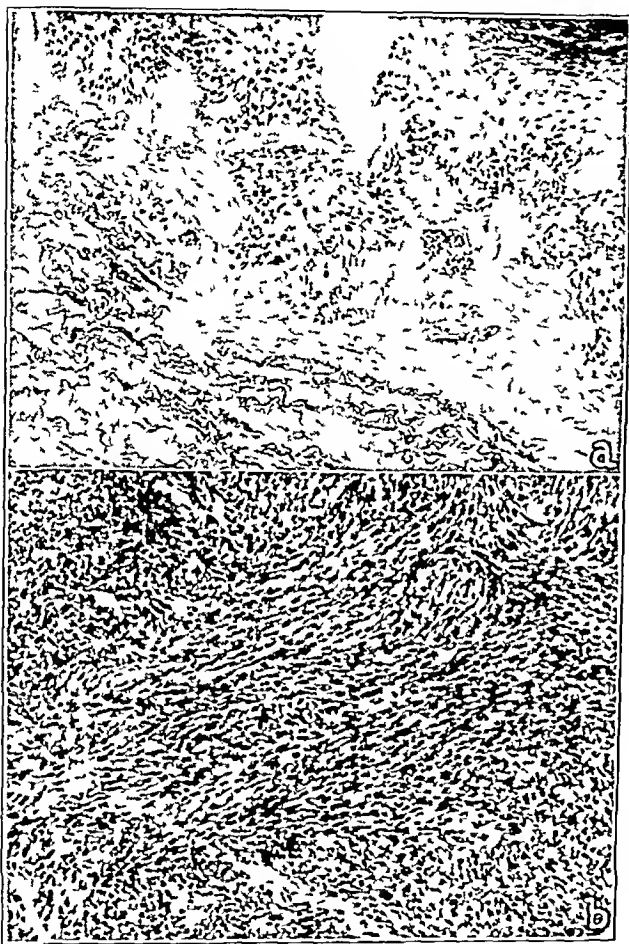


Fig. 6—*a* squamous cell epithelioma grade 2 from hand showing individual cell keratinization, dilated capillaries and lymph spaces and basophilic staining of elastic fibers in cutis (hematoxylin and eosin) and *b* squamous cell epithelioma grade 4 from cheek, resembling fibrosarcoma. Numerous mitotic fibers and marked lack of differentiation of tumor cells are seen.

received radium alone, and three had received both radium and roentgen rays, the remainder had received only roentgen rays. It is to be emphasized that epithelioma resulted in only one case in which clinical injury was of the first degree, on the other hand, six of the twenty patients with third degree injuries of the skin (30 per cent) developed epithelioma, and twenty of 115 patients with second degree injuries (17.4 per cent) developed epithelioma. In eight cases the epithelioma originated in ulcers, in eleven cases in keratoses. In the remaining cases in the group its origin could not be determined. Hesse has stated that a feature of roentgen epithelioma is the fact that the lesions are multiple, he found 31.5 per cent of the lesions in fifty-four cases to be multiple. In this series

there were only two cases of multiple epithelioma. Roentgen or radium epitheliomas, however, are frequently surrounded by keratoses or ulcers which later frequently become epitheliomatous.

Various articles in the literature emphasize the slow progression of roentgen or radium epitheliomas and their relatively infrequent metastasis¹² and therefore their relative amenability to treatment. Hesse, however, reported metastatic lesions in fourteen of his fifty-four cases. In our series, definite microscopic evidence of metastasis occurred in two cases, in two other cases, dissection of the axillary nodes failed to reveal metastasis. There were three cases in which operation was beyond consideration because of the degree of involvement, these patients may well have had metastatic lesions.

In this group of twenty-seven patients with epithelioma, at least two, and probably a third, died as a result of the epithelioma, one, a physician, aged 60 whose injury was of an occupational nature, had axillary metastasis at the time of examination and died subsequently of pulmonary and osseous metastasis from a grade 2 squamous cell epithelioma. The second patient, whose injury resulted from irradiation of hypertrichosis, died of grade 4 squamous cell epithelioma which resembled a sarcoma. The third patient had an extensive epithelioma involving more than half his back, this was inoperable and the patient died at home, the exact cause of death not being determined. We have recently learned that another patient died at home with recurrent epitheliomas of the soles of both feet. We believe that if this group of patients should be followed over a longer period of years, the mortality for roentgen epithelioma would correspond to Hesse's figure of 20 per cent, to Porter's¹³ of 25 per cent, to Rowntree's¹⁴ of 23 per cent, and to Cohen's of 24 per cent.

Treatment in this group of cases of roentgen or radium epithelioma was entirely surgical with the exception of seven cases, in four of which the condition was considered hopeless and in three of which the patients were treated elsewhere. Seven lesions were treated by excision followed by skin grafting, six were treated by excision alone, and three were treated by simple amputation, two by fulguration, one by vulvectomy and one by radical amputation.

From answers to letters of inquiry sent in February 1937 it was found that new ulcers developed in some cases in keratoses which had not previously been treated. In one case cauterization of an epitheliomatous ulcer on the finger proved inadequate and amputation was later performed, elsewhere. In none of the cases in which wide and complete excision of a lesion or amputation of an extremity was carried out has there been any recurrence over a period of from two to seven years.

PATHOLOGY OF CHRONIC RADIODERMATITIS

The pathology of chronic radiodermatitis has been extensively studied since the discovery of the condition and the principal histologic changes have been well described¹⁴. Kyrle¹⁵ emphasized the point that

¹² Porter¹³ Hesse¹²
¹³ Quoted by Hesse¹²
¹⁴ Ewing James Neoplastic Diseases. A Treatise on Tumors ed 3 Philadelphia W. B. Saunders Company 1928 Gans Oskar Histologie der Hautkrankheiten Berlin Julius Springer 1928 McCarthy Lee Histopathology of Skin Diseases St. Louis C. V. Mosby Company 1931 Unna, P. G. Die chronische Röntgengeraditis der Radiologen Fortschr. a. d. Geb. d. Röntgenstrahlen 8: 67-91 1904 Mackee G. M. X-Rays and Radium in the Treatment of Diseases of the Skin ed 3 Philadelphia Lea & Febiger chapter 24 pp 333-362 to be published Colwell and Russ¹⁵ Kyrle¹⁵
¹⁵ Kyrle Josef Vorlesungen über Histologie der menschlichen Haut und ihrer Erkrankungen Berlin Julius Springer 1925 vol 2

radium and roentgen rays produce the same histologic picture. Wolbach¹⁶ described rarefaction immediately beneath the epidermis and a great density of the connective tissue deeper down as the most conspicuous of the constant changes in connective tissue. He found degenerative changes in smooth muscle, and obliteration of capillaries by proliferation of the endothelium and telangiectasia arising from existing capillaries. The obliterative changes in the veins and arteries were manifested chiefly by a great increase in the connective tissue beneath the endothelium and by a marked thickening of the media. Proliferation or a decrease in the elastic fibers was also sometimes seen. Hypertrophy of the epidermis was a constant finding. Complete absence of hair follicles and of sebaceous and coil glands was the rule in cases in which the condition was of long duration. In no case was there evidence of proliferation of any of the dermal appendages. Coil glands were often found in regions in which there was a total absence of hair follicles and sebaceous glands.

In this series there were available for histopathologic study five cases of roentgen dermatitis (nonmalignant) and fifteen cases of roentgen and radium epithelioma. The epidermis was found to be hyperkeratotic and acanthotic in every case except one, and usually there was an associated increase in the stratum granulosum. Necrosis and ulceration of the epidermis were frequently encountered. The formation of abscesses and spaces (Lucken) in the epidermis were seen infrequently (figs 6-8).



Fig 7—Roentgen keratosis with squamous cell epithelioma grade 1 in situ showing individual cell keratinization, dilated capillaries and lymphatics, fibrosis and obliterative changes in deeper vessels.

The collagen showed various degrees of simple homogenization, up to that of extensive fibrosis, with the formation of dense sclerotic areas of connective tissue, and it tended to take on a bluish color with

16 Wolbach S B The Pathological Histology of Chronic X-Ray Dermatitis and Early X-Ray Carcinoma J M Res 21 415 449 (Oct) 1909 Summary of Effects of Repeated Roentgen Ray Exposures upon Human Skin Antecedent to Formation of Carcinoma Am J Roentgenol 13 139 143 (Feb) 1925

hematoxylin and eosin. Some edema and apparent increase in elastic tissue were seen in the milder degrees of radiodermatitis, and also, at times, a merging of the collagen and elastic tissue. Sometimes a few fine fibers, apparently newformed elastic tissue, could be demonstrated. Destruction of the elastic tissue occurred in the severe cases of radiodermatitis and where epitheliomatous changes existed. There was new for-



Fig 8—Second degree injury following roentgen treatments of lupus erythematosus. Note ulceration and adjacent acanthosis of epidermis, fibrosis and obliterative changes in deeper vessels in cutis and the fragmentation but also the new formation of elastic fibers. Note also the absence of any dermal appendages (elastic tissue stain).

mation of tiny capillaries arising from thickened vessels in the upper cutis. The larger vessels showed varying degrees of thickening of the adventitia and media and proliferation of the intima to the point of partial or complete occlusion. The infiltrate in the cutis was not consistent or characteristic, polymorphonuclear leukocytes predominating in necrotic connective tissue in areas of ulceration, and lymphocytes predominating elsewhere. The sebaceous glands were almost invariably destroyed. Next and depending on the severity of the radiodermatitis, the hair follicles became involved and in the case of third degree injuries the sweat glands were usually atrophied or completely missing. Hyperpigmentation, a feature of acute radiodermatitis, was not evident, very little melanin being demonstrable microscopically. Lattice fibers (gitterfasern) were increased, especially in and between the malignant epithelial cells of a grade 2 lesion or one of a higher degree of malignancy—which corresponds to Way's¹⁷ observations for epitheliomas in general.

The epitheliomas studied were all of the squamous cell type, no sarcomas, such as have been reported in the literature,¹⁸ were encountered. All the epithe-

17 Way S C Lattice Fibers Their Diagnostic Value in Epithelioma Arch Dermat & Syph 16 25 34 (July) 1927

18 Alius H J Röntgensarkom Beitr z Klin Chir 143 567 573 1928 Holzkecht G Bemerkung zu der Arbeit H J Alius Röntgensarkom im 143 Bande ibid 147 671 672 1929 Mittermaier Richard Sarkom der ausseren Nase bei Lupus aufgetreten nach wiederholten Röntgenbestrahlungen Arch f Ohren Nasen u Kehlkopf 125 283 288 1930 Mulrow F W Roentgen Carcinoma and Sarcoma of Man with Report of a Case J A M A 96 2030 2031 (June 13) 1931 Hesse

thomas originated in the epidermis, there being no sign that they had originated in the hair follicles or sweat ducts. It is to be emphasized that thirteen of the fifteen roentgen and radium epitheliomas studied showed various phenomena of individual cell keratinization, ten showing epithelial giant cells, representing amitotic cell division. Nine of the fifteen lesions presented definite evidence of having begun as epithelioma in situ.¹⁹ Thus roentgen epitheliomas simulate and even duplicate the histologic picture of epitheliomas arising from senile²⁰ and arsenic keratoses, and they tend to begin, as has been said, as epitheliomas in situ with the various phenomena of individual cell keratinization.²¹ In most of the fifteen cases in this group, however, definite penetration into the cutis had already occurred. Studied on the basis of Broders' cell differentiation, two of these lesions were of grade 1, eight were of grade 2, three were of grade 3 and two were of grade 4.

METHODS OF TREATING POSTIRRADIATION DERMATOSES

Complete removal of small keratoses by deep fulguration by the cautery or by various electrical methods of destroying the growth is usually satisfactory in preventing the subsequent development of epithelioma. Radical removal by wide excision of chronic ulcers was early advocated and still represents the best method of approach. Benign ulcers caused by roentgen irradiation may at times be healed by the use of aloe vera -- but this type of treatment is indicated more for acute than for chronic roentgen or radium ulcers. Even though healing results, there remains the likelihood of epitheliomatous changes developing in scar tissue in the thin telangiectatic tissue but only after a period of many years. The use of radon and of ultraviolet rays in the treatment of roentgen dermatitis is of questionable value²² and is not to be recommended. Whenever there is any question of malignant changes a specimen should be taken for biopsy, and depending on the degree of malignancy and the location of the lesion, radical excision or amputation should be performed followed by a suitable type of skin graft. Although the prognosis is dependent on the degree of malignancy, even in the presence of epitheliomas of grades 2 or more, radical methods, such as amputation of a toe or foot, may be attended by conspicuously good results provided metastasis has not already occurred at the time of amputation. Once the lymph nodes have become involved, the prognosis is serious. To temporize in order to try to save a digit or an extremity when amputation is indicated may result in metastasis and death.

SUMMARY

A clinical study was made of 259 cases of chronic radium or roentgen injuries to the skin. The large

majority of injuries seen today are contracted through therapeutic exposure rather than occupationally, as in former years, chronic radiodermatitis being encountered particularly as a result of the injudicious irradiation of various benign dermatoses. Epitheliomas developed in twenty-seven of the cases, and the principle that "the more extensive the injury the more likely the development of cancer thereon" is well established. All the epitheliomas were of the squamous cell type and the majority showed the phenomena of individual cell keratinization and of having begun as an epithelioma in situ. Epitheliomas apparently develop with equal frequency from either keratoses or ulcerations. The prognosis depends on the degree of malignancy and on their complete and radical removal.

Chronic radiodermatitis has a definite and characteristic histopathologic picture. Keratoses should be thoroughly destroyed by electrosurgical measures and ulcers should be excised and the procedure followed by skin grafting. Amputation of a digit or extremity is definitely indicated whenever malignant degeneration has occurred and whenever the lesion cannot be removed completely by wide excision. The early recognition and prompt treatment of "precancerous" radiation dermatoses (and ulcers) would go a long way toward preventing the subsequent development of epithelioma.

COMMUNUTED FRACTURES OF THE OS CALCIS

H. W. SPIERS, M.D.
LOS ANGELES

Experience in the treatment of comminuted fractures of the os calcis in the decade prior to 1930 was most unsatisfactory. Many industrial insurance companies were accustomed to put aside a rather large reserve in the case of such fractures. Their experience with all forms of treatment was so unfortunate that in the state of California they were refusing to allow the surgeons to do other than manipulate and apply a plaster boot. Their experience with subastragaloid arthrodesis was such that few companies could be persuaded even in cases of the most serious disability to allow the procedure. In general, the attitude was that such a fracture was unfortunate, that long-continued disability would follow and that there would of course be a high degree of permanent disability.

Experience in private cases was not quite so unfavorable but in the main was unhappy. It was noted that in the average case of comminuted fracture of the os calcis, if the foot was manipulated and kept immobilized for a rather long period, in the long run a nearly painless though disabled foot was secured. However, it often took from two to four years before this result was obtained. Subastragaloid arthrodesis hastened the process somewhat. To the average patient the results of fusion were disappointing. He expected too much. At best surgical treatment was a compromise and a degree of permanent disability was inevitable.

My interest in Boehler's method of reduction of fractures of the os calcis dates from a visit to his clinic in 1929. The method appealed to me as the only really rational procedure that I had seen. It

19 Broders A. C. Carcinoma in Situ Contrasted with Benign Penetrating Epithelioma. *J. A. M. A.* 99: 1670-1674 (Nov.) 1932.
20 Montgomery, Hamilton. Verruca Senilis and Keratoma Senile. *Minnesota Med.* 18: 735-737 (Nov.) 1935.
21 Montgomery, Hamilton. Histogenesis of Basal Cell Epithelioma. *Radiology* 25: 823 (July) 1935. Arsenic as an Etiologic Agent in Certain Types of Epithelioma. Differential Diagnosis from and Further Studies Regarding Superficial Epitheliomatosis and Bowen's Disease. *Arch. Dermat. & Syph.* 32: 218-233 (Aug.) 1935.
22 Collins C. E. and Collins Creston. Roentgen Dermatitis Treated with Fresh Whole Leaf of Aloe Vera. *Am. J. Roentgenol.* 23: 396-397 (March) 1935. O'Leary P. A. Personal communication to the authors.
Wright C. S. Aloe Vera in the Treatment of Roentgen Ulcers and Telangiectasis. *J. A. M. A.* 106: 1363-1364 (April 18) 1936.
23 Blair A. P., Brown J. B. and Hamm W. G. Surgical Treatment of Postirradiation Keratoses. *Radiology* 19: 331-334 (Dec.) 1932.
Bordier H. Cancers on cutis aux radiodermatites. leur evolution. leur traitement. *Paris med.* 1: 109-114 (Feb.) 1933. Davis J. S. Clinical Illustrations of Deep Roentgen Ray and Radium Burns. *Am. J. Roentgenol.* 29: 43-78 (Jan.) 1933. Soret. Quelques considerations sur les accidents des rayons X traites par le radium. *Zentralbl. f. Haut u. Geschlechtkr.* 29: 778. 1928-1929.

fulfilled the fundamental principles applicable in the reduction of all fractures

1 It overcame the overriding of the major fragments by traction and countertraction

2 It placed the distal fragment in line with the proximal fragment

3 It maintained the position of the fragments until union had taken place

Briefly, the Boehler method for reduction of comminuted fractures of the os calcis is about as follows. Unless the patient is seen immediately the acute reaction and swelling following the injury are allowed to subside. Preferably on the seventh or eighth day skeletal traction pins are placed through the posterior fragment of the os calcis and through the lower end of the tibia. With the knee in right angle flexion on a Boehler frame direct downward screw traction is applied. This is done to correct the upward displacement of the distal fragment, the fragment attached to the achilles tendon and to break up the impaction. It places the distal

fragment in line with the proximal one and restores the so-called tuber angle. This is the angle of the plane of the sub-astragaloid joint and the body of the normal os calcis. It varies from 28 to 35 degrees in the normal foot and is partially or wholly lost in the average comminuted fracture.

Next traction at a 45 degree angle to the tibia is applied. This is the angle of traction which makes necessary the pin fixation of the lower end of the tibia. This traction is applied to overcome the overriding of the fragments and thus restore the normal length of the os calcis. Lateral U clamp compression with metal pressure pads designed to fit the normal lateral curves of the

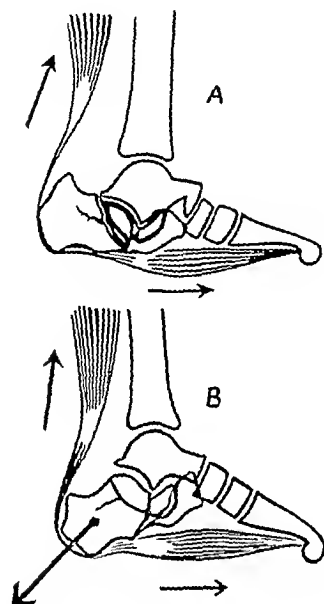


FIG. 1—Boehler's method. A the deformity produced by the gastrocnemius pulling upward and the plantar muscles pulling horizontally. B the direction of pull necessary for correction of the deformity and shortening.

os calcis is now applied. The width of the normal os calcis is estimated, and compression to that width is rapidly applied and quickly released. One might expect with such pressure occasional circulatory disturbance with necrosis of the tissues. I have not had this difficulty.

Check-up roentgenograms in both the lateral and the axial plane are easily obtained while the os calcis is fixed in such traction on a frame. If satisfactory reduction is shown by the x-ray studies, a plaster cast is applied incorporating the skeletal traction. Boehler's nonpadded cast has regularly been used. It allows accurate molding about the os calcis foot and ankle and seems free from troublesome surface pressure. It is split anteriorly before the patient leaves the table thus completely eliminating any possibility of circulatory constriction.

The Braun frame is used for four weeks postoperatively. It is comfortable and keeps the cast steady and

the knee flexed at about a 45 degree angle. Skeletal traction is removed at the end of the fourth week and a plaster boot applied. The patient gets around for about four weeks on crutches. At the end of the

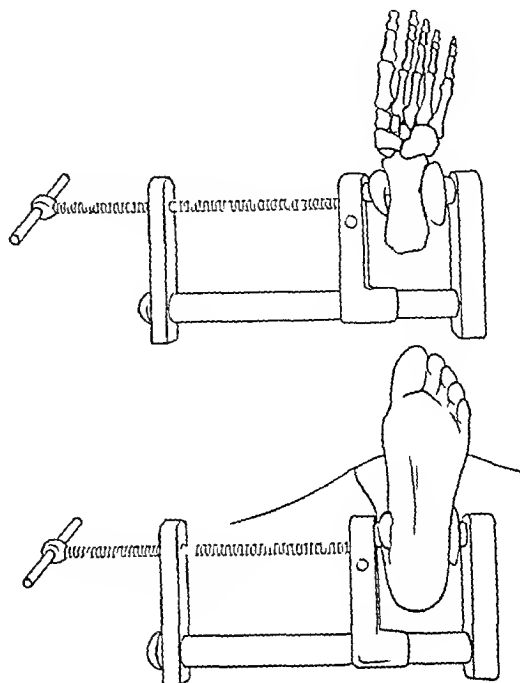


FIG. 2—Boehler's method. Os calcis clamp applied to skeleton and foot to reduce lateral spread. Note that the lateral pad is applied in the axis of the os calcis and the medial kidney shaped pad at right angles to the axis.

eight or ninth week a calf-lift walking cast is applied. This allows partial weight bearing. Full weight bearing is not allowed until the fourteenth week. When weight

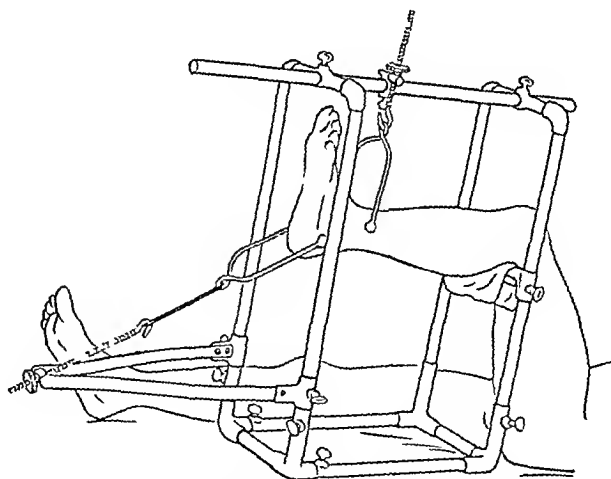


FIG. 3—Boehler's method. Application of the 45 degree traction. Note the 90 degree flexion of the knee and the skeletal countertraction pin in the distal end of the tibia. The heavy felt pad beneath the knee is to protect the circulation.

bearing is begun, an accurately fitting arch support is supplied. I prefer the so-called Roberts os calcis plate. It grips the os calcis and prevents its rotation. It also supports the posterior arch and has been found an essential item in the routine treatment of such fractures.

I am now able to report on a series of thirty-six cases and the end results in a large number is shown

in the accompanying table. All the cases reported are comminuted fractures of the os calcis involving the subastragaloid joint. In all, the fragments were displaced to some degree. No cases are included of simple fracture without displacement or involvement of the joints. None of the patients were seen immediately after the injury. Often they were seen at the end of ten days or two weeks. Two were seen as late as three weeks after the accident.

Certain cases in this series deserve comment. Three patients had comminuted fractures of the os calcis of both feet. Two of these were symptom free and work-

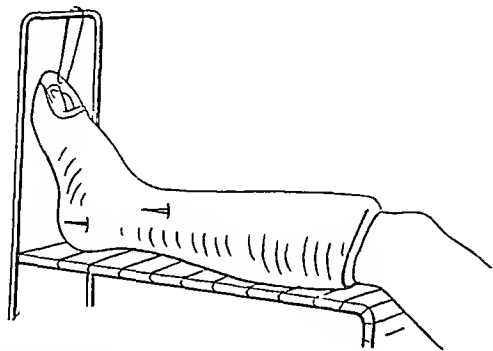


Fig. 4—Boehler's method. The use of the Braun frame to maintain relaxation of the gastrocnemius muscle.

ing on their feet all day by the end of six months. One was symptom free in one foot but not in the other. The painful foot in this case had been comminuted extensively, far forward in the os calcis. One patient sustained a fractured os calcis on one side and a Pott's fracture on the other. He was back in six months at his occupation as a roofer, symptom free. One man who suffered a severely comminuted fracture of one os calcis and whose reduction was exceptionally good walked a distance of twenty miles to my office for his check-up examination. He did this less than six months after his injury. He was wholly symptom free

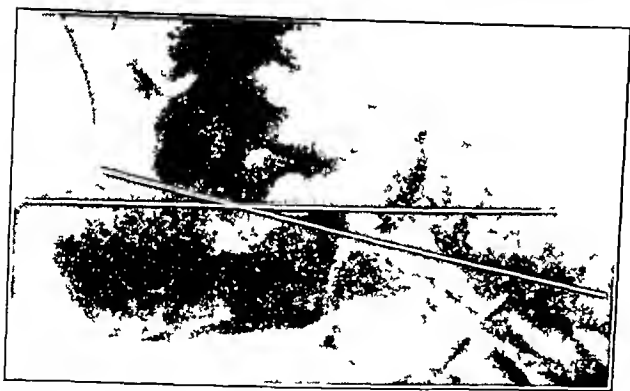


Fig. 5—Comminuted fracture of the os calcis with a minus tuber angle before operation.

Eight of the thirty-six patients were lost sight of within three months after their discharge from the hospital. These were all charity patients. Of the seventeen private patients, sixteen returned to their previous or a somewhat lighter occupation in the average time of slightly over six months. In this group there were carpenters, roofers, oil field workers, painters, laborers and housekeepers. One who had a severely comminuted fracture far forward in the os calcis was permanently disabled from a gainful occupa-

tion forty-one months after his accident. He refused an arthrodesis. The final check-up on the seventeen private patients took place in an average of slightly less than twenty-four months. The foot of only one was seriously painful on walking. Four stated that the foot was painful at times. Six of the seventeen had no



Fig. 6—The fracture shown in figure 5 after operation. Note the anatomic replacement of fragments.

limitation of motion. The remaining eleven all had varying degrees of limitation of tarsal motion in the affected foot. Only one of the thirty-six had any infection. The primary technic was good in this case but the after-care was undoubtedly faulty.

The disabling symptoms that persisted after weight bearing was begun were in the main twofold: (1) pain in the subastragaloid joint on walking over uneven ground and (2) limitation of abduction and adduction of the foot. In a large majority of the cases some

Summary and Results of Comminuted Fractures of Os Calcis

Number of operations	30
Number of cases in which the os calcis on both sides was fractured	3
Number of end results checked	28
Number of indigent patients	11
Number of private patients	17
Number of patients lost sight of	8
Average time since operation	23 months
Average length of disability	6½ months
Limitation of tarsal motion	18
No limitation of tarsal motion	10
End result painful foot	2
End result foot painful at time	7
Infection about pin	1

limitation of pronation and supination seemed permanent. As a rule the pain gradually subsided.

The method itself seems simple enough, but I found as time went on that I was better able to reduce and to retain a reduction than I was at the beginning. Each comminuted fracture varies from the others and apparently requires a somewhat different approach to produce the most satisfactory result. When the patient was not seen for ten to twenty days it was often almost impossible to break up the impaction by traction. The Thomas wrench and sometimes a mallet was used to break up the impaction of the fragments.

The type of fracture that I have not been able to handle to my satisfaction is the one in which the comminution is far forward in the os calcis, the one in which the articular surfaces in this region are fragmented and depressed. I have been able to compress the lateral spread of the fragments in certain of these cases and at a later date have found that the compression did not entirely maintain itself. Possibly, my technic was not the best.

Experience has taught me several rules to follow in reduction and treatment

1 Break up impacted fragments thoroughly, preferably before applying traction. This seems like a valuable point. It is possible that if my patients had been seen early after the trauma this might not have seemed so important a procedure.

2 Place the pin for traction in the os calcis precisely and in accord with leverage principles as indicated in the x-ray films. This placement depends on the fragmentation and the lines of fracture. Sometimes the pin must be placed high and far back. Other times it will be more effective in other positions.

3 Long freedom from weight bearing is essential (from twelve to fourteen weeks). Boehler emphasized this. Apparently there is no short cut.

4 Support for the arches when weight bearing is begun should be a matter of routine.

SUMMARY AND CONCLUSIONS

1 The average end results in the cases I have observed seem to have been satisfactory.

2 Good end results seem largely dependent on the accuracy of reduction obtained and the faithful program of after-care.

3 The Boehler method of treatment of comminuted fractures of the os calcis seems definitely to reduce the length of disability and to give less permanent disability than any other method with which I am familiar.

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ABSTRACT OF DISCUSSION

DR J A LINK, Springfield, Ohio. It has been my privilege during the same period to spend five or six months in Vienna to observe the work of Dr Boehler. I can speak more from clinical observation of his cases than from my personal experience. My own experience in fractures of the os calcis has been limited but the impression that I got from Boehler's clinic

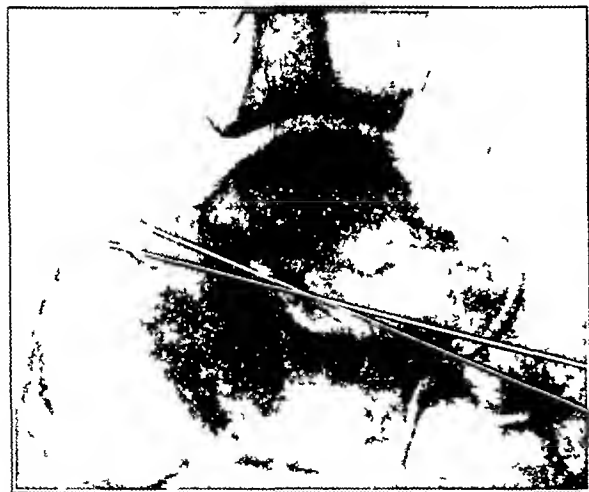


Fig 7—Comminuted fracture of the os calcis with the tuber angle depressed to 3 degrees

was the remarkable results obtained in a comparatively short time, say three to four months. I agree with the author that every detail is necessary in the successful treatment of a fracture of the os calcis. Unless carried out in detail, one is going to have failures. I want to mention briefly the failures that one encounters unless everything is carried out properly. Dr Boehler lays considerable stress on the proper roentgenographic studies, proper exposures, the anteroposterior, the laterals and

perhaps some other angles. Unless one sees the patient a very short time after the injury, one should wait seven or eight days until the edema has fairly well subsided. If edema persisted after that time, it was the practice in Dr Boehler's clinic to massage the foot and institute other measures until the foot was reduced to normal size. Another reason for failure is the improper location of the Steinmann pin. It should

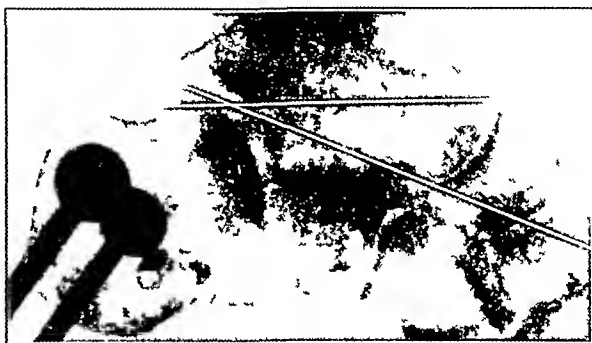


Fig 8—The fracture shown in figure 7 after operation and restoration of the tuber angle

be placed high, posteriorly, as mentioned by the author, otherwise one will have an infection following into the joint. Reduction of the calcaneum must be accomplished before one inserts the Steinmann pin into the lower end of the tibia, too long delay in placing a caliper brace may cause a separation of the fragments after the patient has been up in plaster encasement. Among other errors Boehler lists too early removal of the Steinmann pin and failure to incorporate in the plaster the little fasteners that prevent motion of the pin in the bone, which may cause an infection. Further, he warns against the failure to remove the nail in the presence of infection. Dr Boehler laid considerable stress on the importance of immobilizing the foot in the after-treatment. Other errors consist in improper supports in the shoes for the after treatment. Lastly, what impresses me most is the trusting of these patients to the care of some other physician to carry out the after-treatment.

DR H W SPIERS, Los Angeles. I have wished to emphasize two items. 1 In late cases, even as late as three weeks, one is sometimes able to replace the major fragments of the fractured os calcis. 2 An effort to break up impaction of the fragments is essential to success. Even in early cases the impaction is often so firm that traction will pull the subastragaloid joint apart rather than realigning the fragments. As regards the type of pin used for the skeletal traction, I prefer the rigid stainless steel pin. It is sealed in well to prevent movement in any direction. As is well known one of the most common causes of trouble with traction pins while in place is movement within the tissues.

Early Tuberculosis and the Leukocytes—It is now known that the first attack of the tubercle bacillus is on the neutrophil since it is this cell which first phagocytoses the bacillus. The polysaccharide content of the bacillus is toxic to the neutrophil, and although this is a single cell the destruction in the body begins with the "illness and death" of the neutrophil. Therefore the first skirmish results in defeat for the human body. No sooner do the toxic effects to the neutrophils become manifest, however, than the second line of defense makes its appearance. This consists of the monocytes which surround the ill, dead and disintegrating neutrophils and ingest them and the tubercle bacilli which they contain. There is nothing in the chemistry of the tubercle bacillus which destroys the monocytes. However, the phosphatide content of the bacillus apparently causes their conversion into epithelioid cells. While some bacilli may die in the epithelioid cells others not only remain alive but also multiply. Later lymphocytes are attracted to the site of the developing tubercle.—Miers J A, Diehl, H S, Boynton, Ruth E and Trach, Benedict. Development of Tuberculosis in Adult Life, *Arch Int Med* 59 1 (Jan) 1937

RIGHT-SIDED (REGIONAL) COLITIS

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AND
ALBERT A. BERG, M.D.

NEW YORK

To most clinicians nonspecific ulcerative colitis is a disease of undetermined origin characterized clinically by severe and progressive diarrhea, fever, emaciation and anemia characterized pathologically by an ulcerating process which beginning in the superficial mucosa of the colon, invades the walls of that hollow viscus and spreads remorselessly over the various segments until in the severe cases the whole mucosal surface of the large intestine is involved. The popular and familiar concept is of a disease which has its usual point of selection in the rectum and lower sigmoid,



Fig. 1.—Pathologic appearance in a typical case of extensive right-sided colitis. subtotal colectomy, patient well.

where usually the oldest ulcers and the greatest invasion and cicatrization take place. Hence the inflammation and ulceration spread orally to involve proximal segments, in advanced cases the descending and the transverse colon soon participate, in the most severe type the hepatic flexure, the ascending colon, the cecum and even the terminal ileum eventually participate in the suppurative ulcerating process.

Such a concept is essentially true and accurate and holds for approximately 90 per cent of the cases. In the minority but not inconsiderable percentage of cases the disease takes an essentially different form. Beginning about the hepatic flexure or in the ascending colon and cecum it constitutes a type of disease involving

the right side of the colon in a regional or segmental distribution. Slowly but by sure stages the pathologic process extends aborally to involve the more distal segments, namely, in order the transverse colon, the splenic flexure, the descending colon, the sigmoid and even the rectum, while coincidentally it works back from its original site to occupy fully the cecum and almost invariably the terminal ileum. The march or progression of the disease is usually a matter of time. Spontaneous recovery apart from remissions is rare. The process may stay itself, or its progress may be slowed down at the flexures, thus the hepatic flexure, the splenic flexure and the sigmoid flexure often constitute end-boundaries to the extension of the disease.

The general characteristics of the two forms of the disease are essentially similar. The etiology whatever that may be is probably the same and the pathologic characteristics are identical. In right-sided colitis spontaneous healing is less likely to occur, the course, though often less severe, is nevertheless remorseless and progressive. The diarrhea is less severe and urgent, the complications in the skin and buccal mucosa are almost unknown and involvement of the joints is rare. Strictures on the right side of the colon do not occur and the rectal complications of anal fistula, suppurative condylomas and perirectal abscesses are less frequent. No medical therapy of right-sided colitis seems to be efficacious, surgical treatment properly instituted, offers a permanent cure and that without a disproportionate high risk.

Right-sided or regional colitis constitutes about 10 per cent of all cases of so-called nonspecific ulcerative colitis. It is, however, likely that in the past this form has not infrequently been overlooked. Bargen¹ reported twenty-three such instances of regional colitis seen up to the time of publication of the textbook by Rankin, Bargen and Buie in 1932. It is likely that, with increasing recognition and greater discrimination the percentage of right-sided colitis will rise.

The following report is based on a study of seventeen cases, many of them observed and followed over a course of years. The life history and the progression of the course have been noted mainly by successive radiographic studies as segment after segment of the colon has been successively involved. The group, though small, is rather uniform in its outstanding characteristics, the effects of therapy, medical and surgical, have been closely evaluated, and the indications for operation, as well as the type of operative procedure, have been rationalized.

ETIOLOGY

Right-sided or "regional colitis" a term early used by Bargen and recognized in the writings of members of the Mayo Clinic affects members of both sexes, although it predominates in the male, our series consists of twelve males and five females.

The disease is essentially one of youth, the age incidence at the onset of symptoms averaged 23.4 years, covering the range from a male child of 8 years to a man of 44. Nearly all the patients fall within the decade of from 20 to 30 years of age; younger and older patients are few. One is again impressed with the youthfulness of persons who suffer from both colitis and regional ileitis, it would seem as if the involvement of the terminal ileum and the right side of the colon in inflammatory processes was a distinction of youth following close on the completion of adolescence.

From the Medical and Surgical Services of the Mount Sinai Hospital. Owing to lack of space this article has been abbreviated for publication in *THE JOURNAL*. The complete article will appear in the authors' reprint.

Read before the Section on Gastro-Enterology and Proctology at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1937.

¹ Rankin, F. M., Bargen, J. A. and Buie, J. A. *The Colon, Rectum and Anus*. Philadelphia, W. B. Saunders Company, 1932, p. 1.

As regards the etiologic and pathologic nature of the process, the disease acts as if it were an infection, beginning with fever and prostration and spreading with and against the intestinal current like a low-grade infection. The bacteriology of the feces or of tissue cultures taken from specimens removed at the operating

initial seat of the disease, spreading to involve both the hepatic and the splenic flexure, in one case the splenic flexure alone was first involved. In six cases, when first seen, the disease process had already included the whole right side of the colon, transverse, splenic flexure and descending colon, stopping at the beginning of the sigmoid or at the middle of the sigmoid flexure. It is to be noted that the sigmoid flexure marks a natural barrier, or at least a point of long delay, to the further progression of the infection. However, since at this point in the advance of the process we have regularly instituted surgical procedures, particularly colectomy, we are hardly able to predict what the future course might have been. The natural delay at the sigmoid has proved advantageous for the initiation of a surgical plan. In all cases of right-sided, regional colitis the rectum and lower sigmoid are free of disease, hence the sigmoidoscopic examination is always negative.

THE PROGRESS OF THE DISEASE ITS LIFE HISTORY

Fortunately, in three cases, by observing them radiographically and clinically over a course of years, we were able to note the origin and the progressive stages of the disease process and so to chart the life history of the pathologic invasion (fig 1). In the case of B G, the disease began at the hepatic flexure, within a year it had spread in both directions, involving the ascending and the transverse colon, in another year the process had spread backward or against the fecal current to involve cecum and terminal ileum and forward or with the fecal channel until it reached the sigmoid flexure. The total duration of the disease was from two to three years, when colectomy intervened to restore full health.

In the cases of A H and S B, the process was observed to begin in the transverse colon and extend

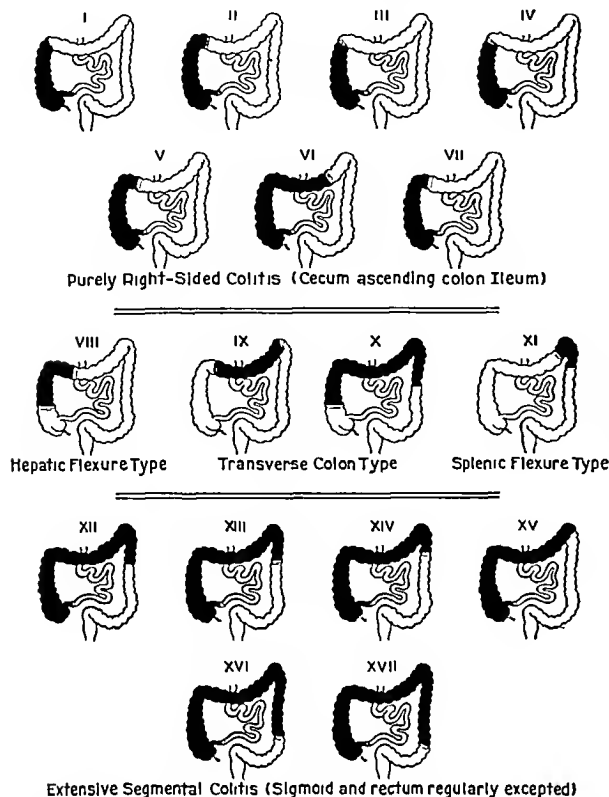


Fig 2—Distribution of lesion. The primary seat or point of election in regional colitis (diagrammatic representation)

table throw no light on its bacterial nature. Streptococci and colon bacilli, the normal residents of the intestinal lumen, are usually culturally present. Dysentery organisms have not been isolated, though in two instances high titers have been observed in the blood serum of the patients when tested for agglutination against standard cultures of dysentery bacilli. Amebas have never been observed.

PATHOLOGY

Right-sided colitis resembles in its gross and microscopic features the same disease as is seen in the involvement of the terminal segments of the colon, namely, a diffuse surface ulceration of the mucosa, suppurative involvement of the submucosa, thickening and induration of all the walls of the intestine, with chronic infiltration and scarring of the peritoneal serosa. The ulcers may be superficial but are more usually deep with thickening edges and often coalesce to denude large areas of mucosa. In the late stage, polypoid hyperplasia is very common (fig 2). In this series perforation did not occur, nor has stricture formation been observed.

The segments initially involved are most often the cecum and the ascending colon (seven cases, fig 3), in this form the terminal ileum is almost invariably included in the pathologic process. In one case the disease began at the hepatic flexure, spreading both ways, in two other cases the transverse colon was the

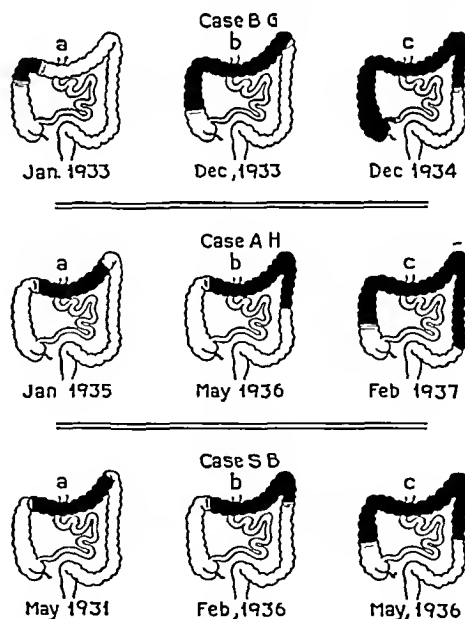


Fig 3—Spread of the lesion. Progressive course or life history of regional colitis (diagrammatic)

distally till it reached the sigmoid. In the former case this note of progression covered two years, in the latter five years. Partial colectomy was performed in both cases at this juncture.

From the limited material it is difficult to draw more than cursory and incomplete conclusions. It would seem

that the disease, rather than remain stationary, progresses slowly in both directions, though the distal rate of extension is faster than the oral one. From two to five years seems to represent the rate of dissemination along the mucosa until most of the colon is involved. In the case of S. B. the original rate was slow, the disease taking five years to involve the splenic flexure. The later course was very rapid, only three months elapsing before the descending colon and sigmoid became involved, indicating that the splenic flexure seemed to offer a temporary barrier slowing up the rate of progression.

In cases beginning in the cecum and ascending colon, the ileum is early involved, but the process seems to be long delayed at the hepatic flexure, remaining limited to the right side of the colon for years, sometimes apparently seeming unwilling to pass that halting point. However, in two of our cases, after an insufficient surgical resection of the right colon a postoperative spread to the remaining portion of the colon was observed, resulting eventually in one case in death.

CLINICAL SYMPTOMATOLOGY

The clinical course during the active stage is characterized by diarrhea, abdominal cramps, fever, loss of weight, a moderate degree of anemia and the development of a mass frequently in the lower right abdominal quadrant.

The diarrhea is rarely very severe, averaging from three to four stools a day, at times there were as many as ten defecations in twenty-four hours, though this number is exceptionally high. In contrast to left-sided or universal colitis, in which movements may amount to from ten to twenty a day or become almost continuous, diarrhea in the form of right-sided or segmental colitis is very moderate, resembling more that seen in pure terminal ileitis. The difference between the two forms, right-sided and left-sided colitis, lies in the involvement of the rectum, a condition of the lowermost segment of the colon leading to urgency, greater frequency and more commonly passage of blood with the movements.

Cramps and generalized abdominal pain are characteristic of the condition and usually precede and are relieved by defecation, they are moderately severe and are periumbilical in location or occasionally localized to the lower right abdominal segment. Nausea and vomiting were exceptional and were seen only once.

Fever is an almost uniform symptom. Of the seventeen cases, three were afebrile while under observation, in the remainder afternoon rises of temperature to from 101 to 104 F. were customary, the degree of febrile elevation corresponding roughly to the severity of the infection and the extent of mucosal involvement and area covered by the infectious process.

Purely right-sided segmental involvement is more likely either to be afebrile or to be characterized by mild evening elevation of temperature. When the transverse and descending colon participate, a more severe course and higher temperature are to be expected.

The loss of weight may be moderate when only the cecum and ascending colon are involved, or severe, up to from 20 to 40 pounds (9 to 18 Kg.), when the remainder of the colon down to the sigmoid are included in the inflammatory process. During natural remissions in the disease, much of the loss of weight may be recovered.

Similarly the anemia is likely to parallel the degree of colonic infection. Variations between 55 and 89 per

cent hemoglobin (Sahli) are customary, though occasionally the figure may sink as low as 40 per cent. Gross hemorrhage is very unusual, having occurred in only one case. In this instance, in which an apparent cure had followed the use of polyvalent antidyenteric serum (moderate high agglutination against Flexner organisms), a severe recurrence several years later was marshaled in by a very brisk gross melena, the hemoglobin dropping to 28 per cent within a few hours. After transfusion and recovery the patient remained well for a few months. The violent hemorrhage then recurred to an alarming degree, colonic resection in one stage resulted in cure.

The differential blood count is never distinctive, a slight leukocytosis occurring only occasionally.

In one case a rash of an erythematous or maculopapular nature was seen on the trunk and to a greater degree on the extremities, particularly the legs. This occurred again in the one fatal case which followed an unsuccessful resection. Otherwise the aphthous stomatitis, the diffused cutaneous papular and ulcerative rash or the deeper serpiginous ulcerations that characterize the more severe type of left-sided colitis were absent.

The physical examination of the patient elicits the general loss of weight and strength, a moderate degree of asthenia and prostration. On abdominal examination a mass may be felt in the lower right quadrant, particularly in those cases in which the disease is purely segmental and limited to the cecum, ascending colon and ileum. The mass consists of thickened cecal wall and lies in the axis of the cecum above the site of the appendix. The ileum is rarely felt as part of the mass, since the ileal involvement is only mucosal and superficial, constituting a backwash infection. This is in contrast to true ileitis, in which the hose-like, indurated, rigid and frequently fistulous terminal ileum composes the palpable and tender mass. In the more widespread right-sided or transverse colitis, the transverse colon as well as the descending colon may appear to the palpating finger as a tender, rigid, cordlike structure.

The rectal (digital) examination is usually negative, no masses being palpable. On observation, however, active anal fistula or scars of healed or previously operated fistulous tracts may be seen. In four of the seventeen cases an anal fistula was observed. In one very severe case a fistulous tract was found at operation between the terminal ileum and the ascending colon, this is, however, a sign of intense and severe involvement of the right colon and ileum and occurred in a patient who eventually died of the progression of the disease.

Sigmoidoscopy is almost uniformly negative, with the sigmoidoscope in situ, pus and mucus may be seen coming down from above. A certain degree of congestion and irritation of the mucosa of the rectum is occasionally reported, but true ulceration, hyperplasia or friability, as well as mucosal abscesses and defects, such as characterize left-sided colitis, are never seen.

In one case we were able to see, with a long sigmoidoscope, the tail end of the ulcerative process in the midsigmoid area, this is, however, very exceptional.

As has already been noted, with the one exception of an ileocecal fistula, ileal or colonic fistulas have not been observed. This is in marked contrast to true ileitis, in which fistulas from the ileum, through the leaves of the mesentery, to various segments of the colon, to ureters, vagina and bladder and to the external abdominal wall are the rule rather than the exception. Postoperative fistulas due to leakage at the site of intestinal

suturing and anastomoses are not very uncommon, occasionally necessitating secondary revisions of the wound and resuturing of a leaking intestinal anastomosis

COMPLICATIONS

Occasionally one encounters a complaint of joint pains, the larger joints being most often the seat of tenderness. True synovitis or arthritis is most unusual. In one case a severe spondylitis involving the lower dorsal and lumbar vertebrae and the sacro-iliac joints were so severe as to require immobilization. With the healing of the lesion the chronic spondylitis subsided, leaving an ankylosed and stiff but functioning back.

RADIOGRAPHY

The usual methods of radiography, both the meal by mouth and the barium sulfate enema, but particularly the latter, serve to demonstrate the lesion. By the barium enema the fuzzy distorted outlines of the diseased colon are shown, especially visible in the affected transverse and descending colons. When ileocecal regurgitation occurs the pathologic terminal ileum can usually be defined as an irregular and spastic loop of ileum, the typical "string sign" characteristic of regional or terminal ileitis is rarely if ever observed.

In the earlier stages only an indistinct, hazy and irregular outline of the diseased segments of the colon is visible, in the later and more advanced stages the colon shows longitudinal and extensive irregular defects. The lesion is never to be mistaken for carcinoma. With the meal given by mouth, it will be noted that the cecum and ascending colon are extremely irritable, difficult to fill, irregular and spastic in outline. When the disease affects only the ileum and cecum and/or the ascending colon, the radiographic appearance is typical of the textbook description of ileocecal tuberculosis and corresponds to the recognized "Stierlin phenomenon" of localized irritability in the cecum and difficulty of filling that segment. However, since in the last five years we have seen no proved case of primary hyperplastic ileocecal tuberculosis, we feel that we have reason to doubt the existence of such a clinical complex. We would like to reserve the final word on that subject for a later day, after a more extensive search of our morbid material.

In addition, with the meal by mouth, the three, five and six hour plates usually define the irregular outline of the terminal ileum, a delay in motility in the loops of the small intestine just proximal to the ileocecal valve is frequently observed. Contrast enemas and mucosal pattern technics have not been particularly effective in delineating the pathologic process.

DIFFERENTIAL DIAGNOSIS

Regional or right-sided colitis is not difficult to recognize either clinically or radiographically, a definite diagnosis before exploratory laparotomy should always be possible. Given a case resembling in all its features a typical ulcerative colitis of the nonspecific type, with rather milder diarrhea, a febrile course with a long history of slowly progressive asthenia, weight loss and anemia, given under such conditions a negative sigmoidoscopy, and one immediately thinks of either an ileitis or a right-sided colitis. The radiography makes the final distinction. In typical left-sided or universal colitis the stools are very frequent, usually purulent, mucoid and bloody, often very sanguineous, nausea and vomiting are common. In ileitis and right-sided colitis the stools rarely exceed two, three or four a day, are

firmer and semisolid and contain some mucus and rarely blood or pus. Vomiting is rare, and perforation or threatened perforation has not been observed. In regional ileitis the palpable mass in the lower right iliac region is very commonly felt more often than in regional colitis, the obstructive phenomena are familiarly observed in ileitis but never in colitis except in the long standing strictured area of the lower sigmoid and rectum.

As previously stated, primary ileocecal tuberculosis of the hyperplastic type is either very unusual in our experience or does not exist. Disseminated intestinal tuberculosis, secondary to an old or recent pulmonary phthisis, is easily recognized by the extensive involvement of the whole of the small intestine and by the presence of tubercle bacilli in the feces. Incidentally, it is usually held that to find tubercle bacilli in the stool of patients with tuberculous enteritis is a very difficult and unusual procedure. Not so, when diligently searched for and properly decolorized and counterstained, the Koch bacillus is regularly recognizable.

Free fluid in the peritoneal cavity or recognizable ascites does not occur in regional colitis. On operation a small amount of clear serous peritoneal exudate may be observed, but never the more extensive ascites of a tuberculous peritonitis or enteritis.

From new growths, carcinomatous or sarcomatous or even benign, regional colitis is easily differentiated by its more extensive range or involvement and by the usual co-involvement of the terminal ileum.

A true differential diagnosis must be made from amebic colitis, particularly that form limited to the cecum and ascending colon. Here only the careful examination of the stool is to be trusted, in the presence of the diarrhea actively motile forms of *Amoeba histolytica* are to be expected and should be found. Part of the regular medical treatment should, however, include a full course of emetine by hypodermic injection, as well as of carbarsone.

PROGNOSIS

It is a little early to discuss, on the basis of so few cases, the ultimate prognosis of the cases of regional colitis in which operation is not performed. Operation has been done in fourteen of the seventeen cases, a fact which in itself betrays our lack of confidence in the conservative handling of such clinical material. Our judgment in such matters and our willingness to operate are based on a defeatism and a skepticism as regards any eventual spontaneous cure or healing by natural or therapeutic means. Only after, in some instances, years of hopeless effort have we been convinced that in these cases medical therapy offers little but a progressively downward course, while surgery offers a permanent cure, though not without risk.

Two patients who have been under observation for only a few months have not been operated on. In the one case (L. B.) an acute onset of only two weeks demonstrated a beginning lesion of the whole of the transverse colon. After three weeks of bed rest the symptoms were much improved, loss of weight was regained, and a repetition of the radiography showed an apparent healing of the distal half of the transverse colon. However, the ultimate course was more important than the immediate effect, since this form of regional colitis does not seem to undergo the frequently unexpected complete remissions with healing that are commonly seen in distal colitis. The course is more likely to be continuous, though less stormy, complete

remissions with disappearance of the lesion and later recurrences we have not observed

In the second case, in spite of long hospitalization and various forms of therapy, slight but unconvincing progress seems to have been made. The future of both these patients is in doubt.

MEDICAL TREATMENT

We have tried various and diverse means of therapy with little success. The diet should be strictly non-roughage, irrigations of acriflavine have not relieved the symptoms, and other forms of irrigations or therapeutic enemas offer little more help. For those cases in which we have found high agglutination titers against dysentery organisms we have advocated specific therapy. This consists of the intravenous injection of polyvalent antidysentery serum in amounts up to 120 cc either in divided doses or in one dose diluted with physiologic solution of sodium chloride. Again no favorable results have been observed. Nonspecific therapy in the form of typhoid-paratyphoid vaccine intravenously administered so as deliberately to produce a chill or a febrile rise of temperature, in the nature of heat therapy, has been essayed in a few of the cases. While this method of treatment offers much in the form of indolent afebrile left-sided or distal colitis, in this form of regional or right-sided colitis it seems to be of little avail.

As a therapeutic test, a course of emetine and carbarsone is regularly indicated in the form that involves only the cecum and right colon, again we have not observed any good results.

To overcome the avitaminosis that threatens as a sequel to the protracted diarrhea, vitamins A and B are regularly prescribed, both in capsule and in liquid form. We have not needed to have recourse to the hypodermic injection of crystalline or soluble vitamins, since the more severe and threatening avitaminosis that results from the lack of absorption of vitamins in a universally denuded mucosa is not seen in the regional form.

The intravenous injections of large volumes of 5 per cent dextrose with or without isotonic saline solution are regularly used before and after operation to replace lost fluids and to avoid salt deprivation. Blood transfusions are frequently used to overcome anemia, as nutritive substitutes, and regularly as a supportive measure in the severe postoperative shock.

Operation is indicated in all intractable cases rebellious to conservative therapy, in all cases showing a tendency to progressive advance of the lesion to new territory, and whenever the pelvic colon is threatened. Since the operation utilized depends entirely on an anastomosis in a healthy sigmoid, it becomes absolutely imperative to intervene surgically whenever the lesion shows a tendency to invade the pelvic colon, this segment is the life line making surgery possible.

TYPES OF OPERATION SELECTIVE PREFERENCES

Various types of operation have in the past been performed in cases of ulcerative colitis both of the universal and of the regional type. Some of these operations have been palliative ones, some of which have attempted partial or complete resection, most of them have sacrificed the continuity of the intestinal tract and created a permanent stoma in the abdominal wall. The risk of all types of operation on a chronically diseased infiltrated colon is a considerable one. It would be well if one could improvise a uniform procedure

which would, with a minimal risk, cure the disease without the creation of an artificial anus or stoma.

In the past we have preferred ileostomy for incurable cases of colitis, particularly of the universal type. We have never favored that operation when it could possibly be avoided, for the following reasons. While it saves the life of the patient, it stamps the disease as an incurable one. It does not prevent the continuance of local and constitutional complications such as arthritis and stricture formation in the diseased colon. The ileostomy can rarely be taken down. The mortality of ileostomy is not less than from 25 to 50 per cent. The same may be said for appendicostomy. In one of the cases in this series an appendicostomy had been performed twenty years earlier. (The appendicostomy really amounted to a cecostomy.) Nevertheless there recurred in the course of years repeated exacerbations of colitis, iritis, arthritis, asthenia and loss of weight.

We have at times experimented with ileosigmoidostomy in the hope of diverting the fecal stream from the ulcerated right-sided colon to the sigmoid. Incidentally, in performing this operation it is the rule to transect the ileum, close both ends of the divided segment and join the proximal end of the ileum by side to side anastomosis with the terminal portion of the sigmoid as low down as is possible above the pelvic peritoneal reflection. A side to side anastomosis without division of the ileum does not sidetrack the fecal current. The object of an ileosigmoidostomy, however, is often defeated by the retrograde peristalsis that is commonly present in the colon. The fecal contents delivered by the terminal ileum into the terminal sigmoid are frequently carried by antiperistalsis even up to the caput coli, thus defeating the purpose of the diversion of the intestinal contents.

The operation of ileosigmoidostomy for diffuse colitis has been performed many times in the past.² According to our experience only one such patient has remained well and free from relapses for a period of five years. One other patient remained well with relapses for about seven or eight years, eventually dying of the original disease. It is of interest to note that at autopsy in the latter case the colon down to the sigmoid was fairly well healed but the disease had spread downward to involve the rectum, death being due to perirectal suppurative abscesses and fistulas. Certainly ileosigmoidostomy in the presence of a diseased sigmoid can never lead to cure.

Subtotal or total colectomy has been done by many competent surgeons and by ourselves for extensive and incurable colitis. The operation takes a heavy toll. Some time in the past, one of us (A. A. B.) performed a complete colectomy in one stage in four cases of diffuse colitis, two of the patients died, two recovered.

OPERATION IN THE PRESENT SERIES FOURTEEN CASES

In four of the cases the disease was localized to the cecum and ascending colon, with or without a slight backwash involvement of the ileum. In these four cases a resection of the diseased portion of the right colon and terminal ileum with an anastomosis in the transverse colon or sigmoid was performed. Two of the patients are entirely well to date, two of them have not recovered, owing to the fact that the resection was not sufficiently radical, the resection of the transverse colon unfortunately taking place in the diseased area.

In both cases the disease subsequently progressed, in one case leading to a diffuse universal colitis with death.

In one of the present series of seventeen cases an ileosigmoidostomy was performed by a member of the surgical staff long before the sigmoid had a chance to become involved. This patient is apparently doing well, though the period of observation has been very short.

In another four cases the disease originated in the right side of the colon but has gradually extended until the splenic flexure has become involved in the inflammatory process. In all four cases a subtotal colectomy was performed in one stage, the continuity being established by an ileosigmoidostomy performed at the same time. One patient, operated on elsewhere, died after operation from shock and infection. The remaining three patients operated on at our institution (A A B) are alive and well. We fully recognize, however, that such a subtotal colectomy as a one-stage procedure must be attended with a high mortality even in experienced hands.

In the remaining five cases in this series the disease had progressed so that the entire right colon and the midcolon, except the lower sigmoid and rectum, were involved in the disease. For this type of colitis, which was neither regional nor segmental but which was now almost universal, it was felt that in the interests of safety some two-stage procedure should be employed which would reduce the risk of operation, cure the patient and yet would not sacrifice the continuity of the alimentary tract. At the Mayo Clinic,³ the Lahey Clinic⁴ and elsewhere,⁵ colectomies for colitis have been successfully performed in numerous cases and the patients cured. However, in the hands of surgeons the world over colectomies are almost invariably associated with permanent ileostomy. We have preferred, if possible, to avoid this unpleasant permanent operative sequel. Therefore, in these five cases the following type of operation was employed by Dr A A Berg.⁶

First, transection of the ileum is made above any diseased area and both ends are turned in and sutured, a side to side ileosigmoidostomy is done with the healthy proximal ileum to the healthy area of the sigmoid, transection of sigmoid is made above the stoma in healthy tissue through its mesentery down to the inferior mesenteric artery. The distal end of the sigmoid is closed by three layers of sutures. To afford further security to the distal end, it is attached by several sutures to the anterior parietal peritoneum just below the lower angle of the wound. The proximal end of the sigmoid is brought out at the upper angle of the wound, fixed by several interrupted sutures and closed either by a clamp or by a heavy silk suture. The obstructing ligature or clamp is removed after forty-eight hours and the contents of the colon are allowed to discharge through this temporary sigmoidal fistula. The patient is allowed to go home for general recuperation, during this period there is a general gain in weight, in strength and in hemoglobin. It is to be observed that a large amount of pus discharges itself through the temporary sigmoidostomy, the diseased area evacuating its suppurative exudate from the body without endangering the suture line at the new stoma (fig 4).

After several months the second stage of the operation is performed. The laparotomy incision is now made in the right side of the abdomen, the omentum is separated from the transverse colon and the mesentery of the terminal ileum, ascending colon and transverse colon is mobilized, the splenic flexure is similarly freed as well as the descending colon down to the new sigmoidal anastomosis. The colon is now removed in its entirety and including the temporary sigmoidostomy, or, if the patient's condition is not too good, this stage of partial colectomy may be subdivided and performed at two separate times. In such a contingency a resection up to the middle of the transverse colon may constitute a complete stage in itself, the distal end of the transverse colon now being sutured extra-abdominally in the abdominal scar. At a subsequent stage the rest of the colon may be removed.

Of the five cases in this series in which this two or three stage operation has been performed, in three all stages have been completed and the patients are alive and well. The other two patients are awaiting the final stage of colonic extirpation, they are in splendid condition.

Apart from the present series, however, one of us (A A B) has performed this operation in four other cases. One of these patients died (after the first stage, in which a desperate attempt was made to sidetrack a previous perforation of the descending colon) with a perisigmoidal abscess, death was due to a secondary perforation of the ascending colon, with peritonitis. The other three patients are well. In all, the operation has been completed with no deaths. In three others, the colon has been partially removed (first stage) with no deaths.

This stage procedure offers several advantages: 1 The element of shock is materially reduced. 2 In the interval between the stages the contents of the diseased colon are conducted outside of the abdominal wall and the new suture lines are guarded from infective material. 3 Extirpation of the colon is made possible even in debilitated individuals. 4 The continuity of the alimentary tract is maintained without a permanent stoma, in the nature either of an ileostomy or of a colostomy.

1075 Park Avenue

ABSTRACT OF DISCUSSION

DR RICHARD B CATTELL, Boston. In reading this paper and hearing it this afternoon, I feel certain that the authors are not attempting to describe any new disease entity. Territorially, the life history and clinical features of the disease, as well as the pathologic features, are similar to the severe cases of chronic ulcerative colitis that begin lower in the intestinal tract and pass upward. One thing is extremely important from the standpoint of therapy, particularly surgical therapy, and that is the method of spread of the ulcerative process in

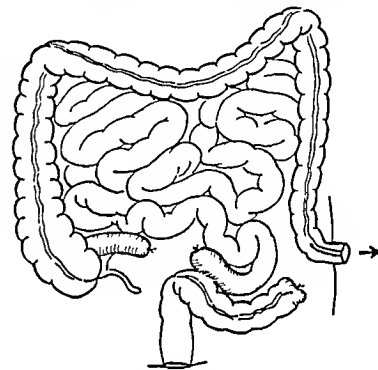


Fig 4.—Implantation of proximal end of ileum into the lower sigmoid. Complete division of two upper ends of sigmoid. Closure of the distal end of sigmoid. Establishment of artificial anus in proximal end of sigmoid.

3 Dixon C F. Report of Surgical Procedures by Judd Pemberton C W Mayo and the author. *Proc Staff Meet. Mayo Clin* 11: 769 (Dec 2) 1936.

4 Cattell R B. The Surgical Treatment of Ulcerative Colitis. *J A M A* 104: 104 (Jan 12) 1935.

5 Finsterer H. *Arch f klin Chir* 164: 349 1931. Tonniss W.

Deutsche Ztschr f Chir 236: 85 1932.

6 Berg A A. *Ann Surg* 104: 1019 (Dec) 1936.

these cases In the cases that I have had the opportunity of observing, I feel that the ulcerative process is one by direct continuity along the mucosa and the intestinal wall itself This is particularly important from the standpoint of therapy, because any operative procedure designed to remove a certain portion of the bowel affected by this process must incorporate complete obstruction of the gastro-intestinal tract above and below the ulcerative process That is absolutely essential Early in my experience when I did six segmental resections for ulcerative colitis of this type, I was unaware of the importance of this and found that, with a loop colostomy, without that the ulcerative process would go directly across it and ascend into the bowel I have had the opportunity of observing the right-sided colitis and have seen it progress to involve all the colon, beginning on the right side rather than in the classic way, from below My earliest case submitted to colectomy was one of this type and I did an ileostomy with the idea of later joining the ileum with the sigmoid Within six months the remainder of the bowel was involved and complete colectomy was necessary I have done six, with satisfactory results in four and unsatisfactory in two I have felt it necessary to do complete colectomies, the removal of rectum and anus, as well as all the colon, in fifteen cases There was one operative death in that group That patient died five weeks after the second-stage colectomy, from a perforation of the ileum proximal to the ileostomy Another patient committed suicide after complete colectomy Of the remaining group, one patient died three months after a second-stage colectomy, from the ulcerative process, and perforation beyond the part that had been removed The remainder are all well The longest period of time is five and a half years since it was done In none of these has there been any return of the general malaise or reaction of the ulcerative process

DR BURRILL B CROHN, New York I recall seeing, two or three years ago, at the Academy of Medicine in New York, a fine exhibit from the Lahey Clinic showing segmental resections of the colon with ileostomies Most or many of the patients had been operated on by Dr Cattell We are not surprised at the low mortality at the Lahey Clinic and the good results of their operative procedures Dr Berg has an abhorrence for either a permanent ileostomy or a permanent colostomy, whether this distaste is based on esthetic or psychic grounds, I do not know It was for this reason that Dr Berg has utilized the two-stage procedure which is described in our paper Somewhat similar procedures have been used by von Beck, by Finsterer and occasionally by others in isolated instances, but I think that Dr Berg is the first one to advocate this type of operation and present it as a routine procedure This operation is not always done in the routine manner, that is, first, ileosigmoidostomy and, second, colectomy I should correct myself and say that Dr Berg often does the second procedure of colectomy in three or even four stages, in the interests of caution and safety I have never seen what Dr Cattell describes as granuloma of the transverse colon Such a granulomatous thickening is more common in the ascending colon Three of our patients have not been operated on In one rather acute case in the transverse colon the condition is much improved, in a case limited to the ascending colon there is slight improvement, a third case of a child involving the entire right side of the colon shows almost a standstill after some years (consent to operate has been refused) Eleven patients have undergone partial or complete colectomy in one or more stages without a death Five of these have had the typical two-stage resection (operation) which Dr Berg prefers There are in addition two fatalities which I should like to explain One of the patients was operated on by a one-stage colectomy at another institution and succumbed to the massive procedure The second one was operated on by Dr Berg and survived the operation However, some months later the symptoms recurred, the colitis extending into the transverse colon and going around to the descending colon and sigmoid until death ensued from inanition Failure in this case is attributed to insufficient resection of diseased tissue It should be noted that segmental colitis, like colitis in general, like ileitis and even like appendicitis is a disease of youth Practically all these cases occurred in young adults, the explanation for which would be very desirable

Clinical Notes, Suggestions and New Instruments

HYSTERIA
(A CASE REPORT)

THOMAS D ALLEN M D CHICAGO

Not only must the physician study a case that requires attention for glaucoma, to determine whether a miotic, mydriatic or operation is advisable, but he must bend every effort to discourage unnecessary use of drops, and of course any unnecessary operation

REPORT OF CASE

Mary, aged 14 years, whom I first saw June 17, 1936, had for about eight months been having headaches two or three times a week For about three months or more they had been

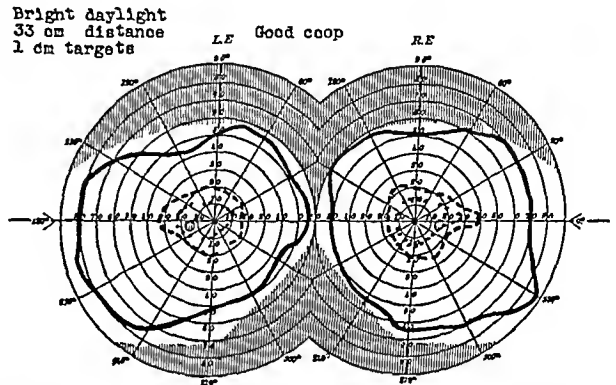


Fig 1—Visual fields June 17 1936 In figures 1 3 5 and 7 the solid line represents the field for form the broken line the field for red and the dotted line the field for green

rather constant She saw rainbows about lights An optometrist thought that she had glaucoma and referred her to an ophthalmologist, who found the tension high on a number of occasions (once as high as 60 mm) and recommended operation During the several weeks under his care he had discharged her once as normal but on recurrence of pain and increased

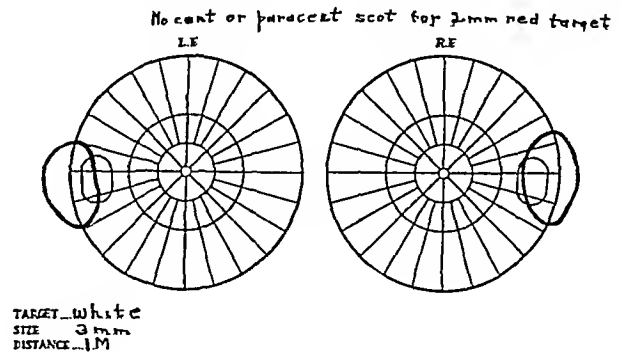


Fig 2—Scotomas June 18

tension (from 35 to 50 mm usually) which was not amenable to miotics, he recommended operation on each eye for juvenile glaucoma

I found her vision to be 20/30+ in each eye increased to 20/20 with a very small correction Her near point was 18 cm (5.5 diopters—Duane's normal for this age, 12.5 diopters) The tension was 23 mm on the right and 20 on the left, the pupils were 3 mm in diameter and active The corneas, anterior chambers, irises, media and fundi were perfectly normal in each eye There was a small central physiologic cupping in each nerve head The peripheral fields for form and colors were somewhat contracted and the blind spots enlarged about three

times, but there were no characteristic Seidel or Bjerrum scotomas (figs 1 and 2) The photometer test gave normal results

Miotics were stopped The next day the tension was the same and the pupils were very slightly larger The pupils were widely dilated with 4 per cent homatropine hydrobromide twice After two hours there was still no change in the tension The following day, no miotic having been used, the right tension was 21, the left 24 After physostigmine salicylate 1 per cent was used four times in two and one-half hours, tension on the right was 15 and on the left 20 The patient was instructed not to wear her glasses and to use no drops for two weeks and then report This she did Then the right and left vision without glasses was 20/20 and tension was right 20 and left 22 During these two weeks she had some pain and the mother said that the eyes "looked dull"

10
330 Form and Colors LE Good coop RE Upper lid raised
Clear day

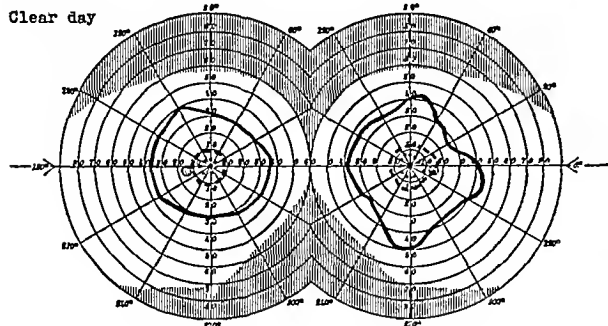


Fig 3—Visual fields August 29

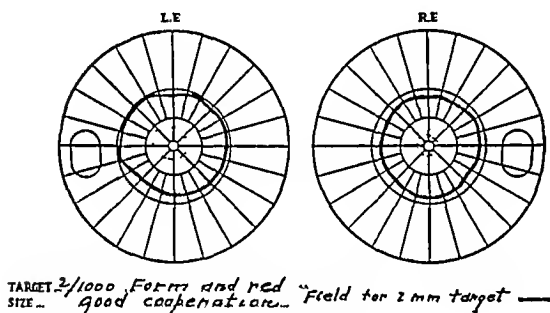


Fig 4—Scotomas August 29

Bright daylight
10 m target
33 cm distance

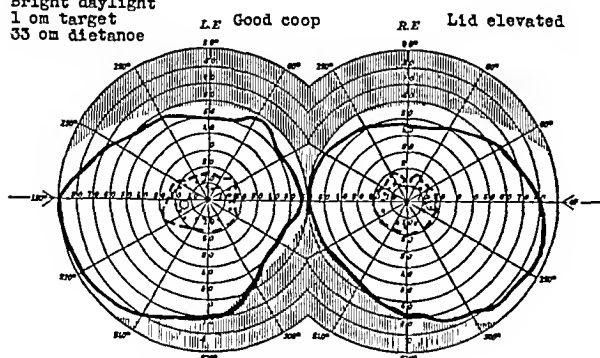
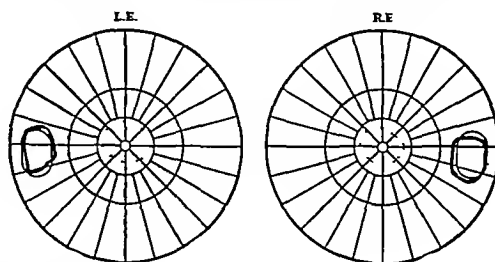


Fig 5—Visual fields October 17

Again she was instructed to discontinue the use of the glasses and drops, this time for six weeks, then her tension was 22 in each eye She was instructed to return whenever she had pain or saw halos or had any other disturbing symptom This she did in two weeks The fields were notably contracted symmetrically and the blind spots could not be located However, since the tension was only 23 in each eye and the pupils

were 25 mm in diameter and the eyeballs objectively, externally and internally still normal, hospitalization and a thorough medical check up were suggested

This was done at the Presbyterian Hospital by Dr A H Parmelee, who found nothing physically wrong but a psychic maladjustment at home The mother had not prepared her for



TARGET 6 mm white
SIZE 4 mm red
DISTANCE 1 meter

Fig 6—Scotomas October 17

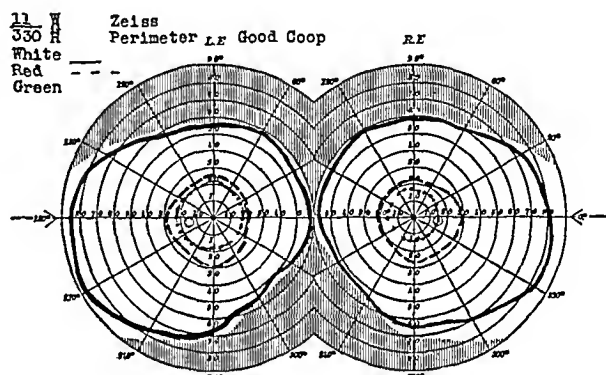
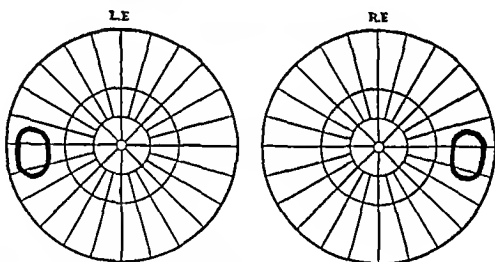


Fig 7—Visual fields March 20 1937



TARGET D 5 12 x 14 cm No scotoma for
SIZE 10 w 100 G. D 5 12 x 15 cm

Fig 8—Scotomas March 20 1937

the changes of puberty and the girl was at a loss to explain them herself The father and brother had been unduly critical The patient had only recently been thrown with other English speaking people and found difficulty adapting herself to her new environment

As a result of a talk between doctor, mother and patient she became better adjusted, the headaches practically disappeared, the fields became more normal and the tension never rose above 22 mm She was quite normal when last seen, March 20, 1937

The diagnosis was a type of hysteria due to maladjustment
122 South Michigan Avenue

Mistakes—In every science and every art, in every business and every trade, mistakes are made they are a part of all men But doctors practice their science and their art on life With that material, a mistake may be irreparable—Paget, Stephen Confessio Medici, New York Macmillan Company, 1931

Special Article

OUR INSUFFICIENTLY APPRECIATED AMERICAN SPAS AND HEALTH RESORTS

BERNARD FANTUS, M.D.

CHICAGO

Physicians who visit any number of American spas and health resorts will find that there is something radically wrong with nearly every one of them. Manager and owner complain that this is due to lack of patronage by physicians. But physicians find that few of the resorts are worthy of their patronage. Obviously a vicious circle exists, which, like the vicious circles of disease, can be broken only by a suitable remedy.

THERAPEUTIC VALUE

Many American spas and health resorts are so poorly visited by patients that their managers have been forced to cater to the well and the wealthy to enable their institutions to survive. This has been done chiefly by providing some form of sport. Physicians may well ask whether such institutions have any therapeutic value at all.

From time immemorial, mankind has had great faith in mineral waters. When a spring was discovered it was subjected at once to the test of the palate. If the water tasted good it was potable water and used by the healthy. If it tasted bad it was tried on those who felt bad. As it sometimes seemed to help them, it came to be vaunted as a cure. In time, experience taught people to appreciate the special remedial value of a particular mineral water for certain ailments. It was not until the day of analytic chemistry that the whole subject of mineral waters could be studied scientifically. Then it seemed that the use of the same chemicals at home might render superfluous a visit to the mineral spring itself. Many physicians still base their practice on this premise, which has been tacitly admitted by the mineral water interests themselves in bottling the water for home use. It still remains to be shown that such use of bottled mineral waters or of salts gives better results than the employment of an appropriate mixture of similar salts that any pharmacist can prepare. Experience has definitely proved, however, that the therapeutic value of a mineral water taken at the patient's home is usually much inferior to the use of a similar water at a mineral springs resort, for some of the important ingredients of the "cure" are missing. These are the remedial value of a vacation, the change of scene and of occupation, the change in the mode of living, the subtle influence of climate and the factor of faith.

A horse chafed by its harness requires being turned loose in the pasture. How much greater is the benefit of a vacation for a human being chafed by a mental and a physical harness. A vacation is admittedly one of the most potent forms of the "rest cure", but advising a vacation without suggesting where it should be taken is inviting failure to achieve the desired result. The change itself may mean escape from chemical poisons, physical hardship or mental duress. It may indeed be accepted as a therapeutic axiom that many chronic ailments are maintained by some error in the habitual mode of living or some unfavorable influence in the

patient's usual surroundings. Many times this error or unfavorable influence is at once removed by getting away from home and work. Indeed, whenever a patient is cured by going away from home but relapses when he returns, there is proof of an unfavorable domestic influence. A vacation away from home may therefore have a diagnostic as well as a curative value.

The great psychotherapeutic value of sending a patient to a health resort must be recognized. It starts with the very giving of the advice, it grows progressively as the patient goes on his pilgrimage, arrives at the health resort, becomes one of a crowd of health seekers and comes under the influence of the optimism of the physicians and all others connected with the establishment. He may even feel better under these circumstances though his disease is relatively incurable.

Change of scene and occupation bring a change in the habitual mode of thinking and of functioning. The physician has largely gotten away from the prolonged bed rest treatment of the complicated "Weir Mitchell rest cure," but he must appreciate the fact that one of its essential ingredients was a program which kept the resting patient amused while "nature" worked the cure. A health resort must provide such diversion in addition to the change of scene.

A health resort is a place endowed with special natural remedial resources that are not to be found everywhere, and climate, with its alterative influences on the functions of our body—the purity of air, difference in density, humidity, winds, and sunshine—may, if skilfully chosen, be of the greatest possible help in securing a desired therapeutic result.

Numerous are the conditions in which a favorable climate will make all the difference between recovery and incurability, or at least between comfort and misery. All persons who are sick during the winter and are well during the summer should be given the benefit of such change of climate as will enable them to enjoy summer all the year round. Is there any excuse for permitting a victim of winter cough to get worse year after year until he is an old man before his time? Perpetual summer might make him well and capable of enjoying his normal span of life as a useful member of society. Rheumatism in its various forms is largely a climatic disease, and it may be treated by climatic therapy. So is hay fever and many a case of asthma. That the tuberculous may get well in any climate is a maxim of practical value under present day economic conditions, but no one will deny the fact that many a tuberculous person will get well more quickly, more pleasantly and more certainly when given the benefit of suitable climate in addition to other appropriate treatment.

THE SELECTION OF A SPA

A spa is a health resort that has one or more therapeutically valuable mineral springs. Quite as important as the choice of the proper climate is the choice of that variety of mineral water which will exert the most favorable possible influence on the patient's functions and metabolism in those cases of disease amenable to such therapy. Since similar mineral springs may be found in greatly diverse climates, the correct selection of a spa is a test of the physician's knowledge of both climatic therapy and pharmacotherapy.

A principle not sufficiently appreciated in connection with the drinking of mineral water is that the most important constituent of mineral waters is the water, mineral waters being, with few exceptions, very dilute.

solutions of salts The saline ingredients of mineral waters in many instances serve merely to point the path the water is to take in its elimination from the system If the water is associated with poorly absorbed saline ions, it will be eliminated chiefly by way of the bowel in the form of liquid stools If it has ions that escape chiefly through the kidneys, diuretic action results If it contains ions that are eliminated by the mucous membranes, a thinning of mucous with improvement in conditions of the various mucosae may be obtained Hence spa therapy is decidedly advantageous in the treatment of constipation, cholelithiasis, nephrolithiasis and cystitis as well as bronchitis with scanty expectoration The desired effect is secured only provided a sufficient amount of water is ingested at one time It must be realized, however, that the drinking of large quantities of water is not always advisable It is contraindicated in such conditions as motor insufficiency of the stomach, cardiac insufficiency, nephritis, edema from any cause, aneurysm, arteriosclerosis and tendency to internal hemorrhage

The physician must not lose sight of the fact that diet therapy also has a determining value in the success or failure of the treatment of many a disease It is obvious, therefore, that the ideal climate and the most curative mineral water are of no use to many sick persons unless there can also be secured suitable hotel accommodations and appropriate diet, and these must be available within the financial means at the command of the patient

INFORMATION NEEDED

From the foregoing it is obvious that ordering a patient to a spa is the most complex prescription possible It combines pharmacotherapy with diet, physical and climatic treatment and psychotherapy It not only demands from the prescribing physician the skilful individualization of all these requirements to fit the patient's needs but also presupposes the availability of a skilled physician resident at the spa or health resort to carry out this complex treatment in a suitable manner Even though I have studied the different items of therapy embraced in spa and health resort treatment, I must confess to an embarrassing degree of ignorance in regard to our American natural remedial treasures European physicians are much more fortunate in this matter Indeed, the government and the governmentally owned medical schools of the various European countries see to it that their doctors are well informed as to their own national remedial resources This is not only altruistic but also sound financial policy for, through taxation, governments are in virtual partnership with all the national enterprises

Physicians are disgusted with the quackish propaganda and practices of most American health resorts They and their patients know more about the European than the American spas, although as a matter of fact there are in this country practically all the climatic and balneic remedies possessed by any other country in the world This state of affairs costs Americans many millions of dollars annually There is not only a net loss to this country but also a financial loss to the patients who are sent abroad for a treatment that they could secure much more economically nearer home

The geographic question is therefore a matter that should be considered in the choice of the health resort, and it is a reflection on the knowledge and intelligence of a prescriber if he sends a patient farther away from home than is necessary American physicians are in

great need of information regarding the natural remedial resources of their own states, and it should be—indeed it is—the function of the state governments to secure and disseminate this information Unfortunately, the state governments, with a few notable exceptions, among them the state of New York, have largely been derelict in this matter Mineral water resorts should be health resorts in the truest sense, and health resorts that specialize in the treatment of the diseases for which the natural resources available in the place especially fit them Diet, drugs and physical measures known to be of value in such diseases should be employed The accumulation of many cases of similar disease should give the medical staff an exceptional experience with such cases, and this, together with the exceptional natural and artificial resources present, should enable them to render the most efficient service possible in the treatment of conditions for which their health resort is especially suitable

Unfortunately, there are in this country few institutions of this kind, and these few are not sufficiently well known to the rank and file of the American medical profession Not so in Europe There, with centuries of experience behind them, the governments supervise their natural springs They see to it that the springs are under competent scientific management and that suitable care, proper accommodations and even amusements are provided for the rich as well as the poor By instruction in the medical schools they provide that their medical men are well acquainted with the special merits of these national resorts A yearly "Bader Almanach" (Baths Calendar) is published for the guidance of the medical profession, in which all the important data concerning the health resorts can be found Annually, tours to the various health resorts are arranged for physicians On these, at minimum expense, physicians have the opportunity—besides enjoying a delightful vacation trip—of becoming personally acquainted with the resources and the staffs of these resorts, so that, when they send a patient to a spa or a climatic station, they know who will take care of him and what care he will receive The all-important correspondence between the attending physician and the physician at the health resort also takes place as a matter of course

How different are things in this country! With over 2,000 places in the United States boasting of springs of more or less medicinal value, with the possibility of commanding watering places in almost any climate and at any season, the members of the medical profession are so poorly informed about them that, when need of spa treatment arises, they are more likely to know a suitable European spring than one in this country This is because textbooks and teachers have more to say about the latter than the former Distrust and skepticism likewise prevail regarding our mineral spring resorts With a few notable exceptions this is well merited, for the mendacity of many of the advertisements for mineral springs rivals that of the claims for "patent medicines" in their palmiest days Unethical practice and quackery abound in and around health resorts Even the social features and amusements, in many of them, may be objectionable from a therapeutic as well as a moral standpoint

The American Medical Association has struggled successfully with such problems as the improvement of medical education, through its Council on Medical

Education and Hospitals, and with the still thornier problem of proprietary medicines, through its Council on Pharmacy and Chemistry. It is helping physicians to a better appreciation of dietetics and of physical therapy by the councils dealing with these matters. It now remains for it to render the same service to this important as well as largely unappreciated national remedial asset.

719 South Ashland Avenue

Special Clinical Article

NONSPECIFIC TREATMENT OF SYPHILIS

CLINICAL LECTURE AT ATLANTIC CITY SESSION

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There has been an increasing display of enthusiasm for the nonspecific therapy of syphilis during the past ten years. It is readily acknowledged that the credit for this development belongs to Wagner von Jauregg.¹ His demonstration of the efficiency of malarial therapy of dementia paralytica precipitated a world-wide search for other measures that might be of value in the treatment of patients who manifested the resistant types of syphilis. The effort to develop these more efficient remedies was stimulated not only by the results of Wagner von Jauregg's experience but also because syphilologists had learned of the therapeutic accomplishments as well as the therapeutic limitations of the arsenical drugs and the heavy metals. For a decade following the introduction of arsphenamine the effort to produce cures by the use of this new specific was so great that the patient's defensive mechanism, which is the potent factor in the cure of disease, was temporarily forgotten. Accordingly, the results of malarial therapy and the established incompetences of arsphenamine, its numerous modifications, and bismuth and mercury compounds created among syphilologists a receptive mood for a new method of treatment. Hence the enthusiasm for shock therapy in syphilis, as displayed in the medical literature, is an expression of the effort to find a remedy that will produce more satisfactory therapeutic results than have been obtained with chemotherapy.

Fever therapy is the most popular of the numerous nonspecific measures now in use, but its vogue at present does not necessarily mean that it is the method *par excellence* or the one which will eventually be shown to produce the acme of therapeutic results. Perhaps the future will reveal a more effective therapeutic method.

What may be expected from nonspecific therapy? What are the comparative values of the various nonspecific methods of treatment now in use? What manifestations of syphilis are most responsive to nonspecific therapy? These are only a few of the questions which might be considered in a discussion of this treat-

ment of syphilis. The answers to these will bring out the essential value of shock therapy.

The development of new agents that are more efficient than those now used in the treatment of syphilis is needed because the "specific remedies" in use at present not only produce cure in a limited group of the cases but have to be administered for a prolonged period in order to produce the desired results. Their use also is attended with complications and technical difficulties, in addition to economic handicaps which limit their usefulness. The outstanding value of the chemotherapy of syphilis is the ability to prevent the development of the serious sequelae of syphilis, even though cure is not produced.

Although the various principles employed in nonspecific therapy are of physiologic, infectious, chemical and physical nature, I shall limit this consideration to the reports of the American workers on malarial therapy, electropylrexia, vaccines and hot baths.

By 1924 the reports in the literature indicated that remissions had occurred in from 20 to 35 per cent of cases of dementia paralytica in which the patients had been treated with malaria. The patients who were treated in the early days of fever therapy had the advanced forms of the disease, while today the threshold of suspicion in regard to dementia paralytica has been increased to the point at which this serious complication is now recognized early in its course. Accordingly, the results of the treatment of dementia paralytica by fever-producing agents are now better than they were ten or twelve years ago, because as a rule the treatment is now given shortly after the appearance of the clinical signs. In my experience with patients who present incipient signs of dementia paralytica, the incidence of remissions which are of sufficient degree to permit the patient's return to work now approximates 60 per cent in cases in which malarial therapy is used. Experience with malarial therapy during the last twelve years has shown that it is of more value in the prevention of dementia paralytica than it is in the treatment of this condition. The basis for this statement² is the fact that excellent therapeutic results were obtained in 85 per cent of the cases in which malarial therapy was used while the serologic tests for syphilis were positive but when the clinical symptoms of dementia paralytica were only presumptive.

Because of the multiform character of tabes dorsalis it is difficult to appraise the results of fever therapy accurately. This is particularly true in evaluating the influence of treatment on such incapacitating complications as gastric crisis, ataxia and the severe lightning pains. My experience coincides with the conservative reports in the literature, namely, that, if malarial therapy is employed following chemotherapy and while the reaction of the spinal fluid is positive for syphilis, it produces relief in about a fourth of the cases of tabes dorsalis. On the other hand, malarial therapy has been of decidedly less value in cases of tabes dorsalis in which incapacitating complications have persisted after the blood and spinal fluid become negative spontaneously or as a result of chemotherapy. Observations which I made in the first year following the malarial treatment of serologically negative patients with tabes led me to believe that worthwhile results were going to be obtained, but continued observation has revealed a return of the crises and "lightning" pains in most of

From the Section on Dermatology and Syphilology, the Mayo Clinic. Read in the General Scientific Meetings at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 8, 1937.

¹ Wagner von Jauregg, Julius. Ueber die Einwirkung der Malaria auf die progressive Paralyse. Psychiat. neurol. Wehnschr. 20: 132-134 (Aug. 31) 1918.

² O'Leary, P. A. and Welsh, A. L. Treatment of Neurosyphilis with Malaria. Observations on Nine Hundred and Eighty-Four Cases in the Last Nine Years. J. A. M. A. 101: 498-501 (Aug. 12) 1933.

the cases. Optic atrophy is occasionally favorably influenced by malarial treatment. In some cases the treatment arrests the progressive loss of vision. In cases of this type it is advisable to give at least one course of treatment and to administer small doses of arsphenamine and preparations of bismuth or mercury before inoculating with *Plasmodium vivax*. In the asymptomatic type of neurosyphilis, malarial therapy will cause³ the reaction of the spinal fluid to become negative in 26.5 per cent of the cases in which the reaction has remained positive after the use of specific treatment.

The results of the use of nonspecific measures in the treatment of children who have congenital neurosyphilis have not been as satisfactory as they have been in the acquired form of the disease. However, in a group of twenty-six patients whose ages ranged between 10 and 31 years and who had clinical and serologic manifestations of juvenile dementia paralytica of tabetic type, definite arrest of the disease was noted in twelve, or 46 per cent, following the use of malarial therapy. The remissions in these children were less complete than in patients with acquired syphilis, as there was evidence of stationary mental impairment as long as ten years after the reaction for syphilis had become negative.

Malarial therapy has been demonstrated to be an unnecessary type of treatment in cases of latent syphilis and is of little value in cases of visceral syphilis. A bewildering mass of literature on the value of malarial therapy has already appeared, and the reader who is interested in a review of the literature on the subject is referred to the recent survey made by Vonderlehr.⁴ Those concerned with a detailed appraisal of malarial therapy are referred to the excellent monograph written by Dattner.⁵

Malarial therapy does not lend itself to general use, it is a hospital procedure attended with some risk and is not applicable to all patients. Accordingly, it is obvious why numerous other methods for the production of fever have been developed as a substitute for *Plasmodium vivax*. Among these are sodoku (rat bite fever), relapsing fever, typhoid vaccine, tuberculin, bacterium, hot baths, and such mechanical units as short wave diathermy, radiant heat cabinets, hypertherms, diathermy, electric blankets, electric induction coils, electric light baths and the inductotherm. Some of these substitutes, such as sodoku and relapsing fever, which have therapeutic merit, were found to be impractical for one reason or another and have not become popular. Others, such as typhoid vaccine, bacterins and hot baths, have found advocates who use them as substitutes for malarial therapy. The electrical units for the production of fever, although they have been steadily improved, are still in the process of evolution. The impression is prevalent that these mechanical units when used alone are highly efficient in the treatment of all manifestations of syphilis. The mechanics of the treatment has popular appeal and no criticism can be made of the effort to popularize the idea, but it is nevertheless a misfortune that the hopes which were raised early in

the experience with these units have not been substantiated by the test of time. Those who induce fever mechanically now recommend, as do the advocates of malarial therapy, the administration of arsphenamine and preparations of bismuth or mercury during or after the administration of fever in the treatment of all types of syphilis because the use of the fever alone has been shown to be inefficient.

The fever-producing machines made their debut in the form of the radiotherm, which was suggested by Whitney⁶ and by Carpenter and Page⁷ in 1930. These soon gave way to other units, of which the most prominent at the present time is the hypertherm, which was developed by Kettering and Simpson.⁸ Other contributors to the development of this type of therapy have been Neymann and Osborne⁹ and Hinsie and Blalock.¹⁰ Although a sufficient length of time has not as yet elapsed to permit accurate evaluation of the fever machines, the experience has been enough to create some definite impressions. In the group of cases collected from the literature by Neymann¹¹ the results of artificial fever treatment indicate that 22 per cent of the patients who had dementia paralytica had clinical remissions, while 39 per cent were improved. Simpson⁸ noted that combined artificial fever therapy and chemotherapy offered encouraging results in the treatment of patients who had early syphilis. These results, although obtained sooner than with chemotherapy alone, were but slightly better than those obtained with the intensive use of arsphenamine and preparations of bismuth. In the discussion of Simpson's paper, Stokes¹² emphasized that in the treatment of early syphilis the already established specific remedies should not be discarded for fever treatment, which is still not only in a highly experimental phase but should be used only by those especially trained to administer it. Until a larger series of patients have been treated and observed for a sufficient time, the use of fever therapy in early syphilis should be limited only to those cases in which the extensive use of chemotherapy has failed to control the infection. Furthermore, it should then be given only by syphilologists who are experienced in the use of fever therapy. To derive the maximal benefit from fever therapy in the treatment of early syphilis, it is especially significant that chemotherapy should be employed after the fever treatment. Bennett,¹³ in a preliminary report, noted that, in a small group of cases of tabes dorsalis in which the symptoms were resistant to treatment and the reaction of the spinal fluid was positive for syphilis, all patients were materially benefited following the combined use of hyperthermia and chemotherapy. Further observation of this group is necessary before great significance can be attached to this report, because the immediate results from malarial therapy alone in a similar group of cases were at first equally encouraging, but a return of the symptoms in

6 Whitney W R. Radiothermy. *General Electric Rev.* 35: 410-412 (Aug.) 1932.

7 Carpenter C M and Page A B. The Production of Fever in Man by Short Radio Waves. *Science* 71: 450-452 (May 2) 1930.

8 Simpson W M. Artificial Fever Therapy of Syphilis. *J A M A* 105: 2132-2138 (Dec 28) 1935.

9 Neymann C A and Osborne S L. Artificial Fever Produced by High Frequency Currents. *Illinois M J* 56: 199-203 (Sept.) 1929.

10 Hinsie L E and Blalock J R. Electroprexia in General Paralysis. *Utica N Y State Hospitals Press* 1934 pp 190.

11 Neymann C A. The Treatment of Syphilis by Artificial Fever. unpublished data.

12 Stokes J H. In discussion on Simpson W M. Artificial Fever Therapy of Syphilis. *J A M A* 105: 2132-2133 (Dec 28) 1935.

13 Bennett A N. Fever Therapy in Tabes Dorsalis. Relief of Gastric Crises and Lightning Pains by the Use of the Kettering Hypertherm. *J A M A* 107: 845-849 (Sept 12) 1936.

3 O'Leary P A, Cole H N, Moore J E, Stokes J H, Wile U J, Farran Thomas, Vonderlehr R A and Usilton Lida J. Cooperative Clinical Studies in the Treatment of Syphilis. Asymptomatic Neurosyphilis. *Arch Dermat & Syph* 35: 387-401 (March) 1937. *Ven Dis Inform* 15: 45 (March) 1937.

4 Vonderlehr R A. Malaria Treatment of Parenchymatous Syphilis of the Central Nervous System. Supplement 107 to Public Health Reports 1933 pp 170.

5 Dattner Bernhard. Moderne Therapie der Neurosyphilis mit Einschluss der Punktions- und Liquoruntersuchung. Vienna: Wilhelm Haendrich 1933.

many of the cases soon dissipated my optimism as to the value of malarial therapy in the treatment of this complication of syphilis

Barnacle, Ebaugh and Ewalt¹⁴ recently compared the relative merits of malarial therapy and the combination of artificial fever and tryparsamide therapy. In cases of dementia paralytica they found a slight increase in the incidence of improvement in the cases in which artificial fever and tryparsamide were employed. The further observation of these patients, as the authors demanded, is essential to a worth-while comparison of the methods.

Hinzie and Blalock¹⁵ reported their experiences with four types of treatment of dementia paralytica and evaluated these methods in the following order: high frequency currents and tryparsamide, tryparsamide used alone, malarial therapy, and high frequency electricity used alone. The study again emphasizes the superiority of a combination of fever therapy and tryparsamide over any single method of treatment in cases of dementia paralytica.

The other methods of producing fever, such as hot baths, typhoid vaccine, bacterins, various preparations of sulfur, and milk, still have numerous advocates. The results following the use of these agents in the treatment of the more malignant types of neurosyphilis are less favorable than the results obtained with malarial treatment or fever produced by the mechanical units. However, the former agents possess definite merit in the treatment of some of the milder forms of resistant syphilis. The use of typhoid vaccine is economical, it does not require hospitalization or a trained personnel, it may be given when graduated reactions are sought, and it may be used in conjunction with chemotherapy. It is less efficient than malarial therapy and accordingly should be selected as the method of choice when a mild nonspecific effect is required. I have found it of value as a provocative agent in patients who spontaneously abort the malaria and also in finishing a course of malarial treatment which was incomplete for one reason or another. Typhoid vaccine has been of material value, when used in combination with chemotherapy, in cases in which interstitial keratitis, neuroretinitis, resistant cutaneous and osseous syphilis, and perforations of the hard palate were present.

Dennie and his collaborators¹⁶ found that hot baths had therapeutic value in cases in which malarial treatment or electropyrrexia was not available. The authors reported beneficial results in cases in which there was interstitial keratitis, retinitis, syphilis of bone, deafness, cutaneous syphilids, hepatitis or neurosyphilis. Kemp and Stokes¹⁷ noted that administration of bacterins produced improvement similar to that produced by typhoid vaccine. Other investigators have reported that, of the various chemicals used, the administration of sulfur by intramuscular injection has produced the most encouraging results.

All types of nonspecific therapy of syphilis are used empirically. The literature contains numerous hypotheses as to the mechanism that produces the satisfactory results of fever therapy, but not one of these offers

sufficient evidence to warrant its acceptance, except as a theory. In the fever induced by the malarial treatment, as well as in that produced by other nonspecific agents, it is my impression that the satisfactory therapeutic effects are the result of some fundamental change in the immunologic processes, the nature of which is unfamiliar. The high temperatures which are produced may be a factor in bringing about these changes.

Accordingly, in the field of fever therapy there are various schools of thought, some advocate malarial therapy, some advocate mechanotherapy, some advocate balneotherapy, and some recommend biologic or chemical agents for the production of nonspecific effects. The advocates of these various agents are not in disharmony, all are striving to produce, by various means, therapeutic results which are not possible with the specific remedies.

Nonspecific therapy is not a panacea in the treatment of syphilis. The specific remedies, arsphenamine and compounds of bismuth and mercury, are still the outstanding modalities for the treatment of early syphilis and, when given in sufficient quantities for a sufficiently long time, they will not only cure the great majority of patients who have early syphilis but will prevent the development of the serious late complications of the disease in all but a few of the cases. Nonspecific therapy, especially fever therapy, may be of value in certain manifestations of syphilis when chemical therapy has failed. The advocates of all types of fever therapy now urge that the arsphenamines and preparations of bismuth or mercury should first be given a fair trial. It is especially suggested that the drugs be given during or after the course of fever, as experience has demonstrated that fever therapy when used alone will control the disease in only a small percentage of the cases. Accordingly, the evidence collected thus far from observation of a large series of cases warrants the use of fever therapy in certain types of syphilis when a thorough trial with the chemical agents has failed to control the disease. The types of syphilis which show the outstanding results from nonspecific therapy are neurosyphilis, interstitial keratitis, resistant cutaneous and osseous lesions, and occasionally relapsing early syphilis. Patients who have latent syphilis, or cardiovascular, hepatic, gastric syphilis or late syphilis of the mucous membranes do not derive any demonstrable benefit from nonspecific therapy.

In frank cases of dementia paralytica, tryparsamide and preparations of bismuth should be given in conjunction with or following the fever treatment, in the cases of early tabes dorsalis and in cases of asymptomatic neurosyphilis. I have found that intraspinal therapy used in conjunction with arsphenamine and preparations of bismuth or mercury offers the outstanding results following the course of fever. Chemotherapy should be given in conjunction with the milder types of nonspecific therapy, such as typhoid vaccine. In the cases in which there is visceral syphilitic disease in addition to the involvement of the nervous system, the treatment used following fever therapy should be directed toward the complication, for example, in the presence of hepatitis the arsphenamines should not be used, while in resistant gumma of the skin or bones the arsphenamines and heavy metals should be given intensively.

The results obtained from malarial therapy and the fever-producing machines are about equal, and in my experience the favorable effects of malarial therapy,

14 Barnacle C H Ebaugh F C and Ewalt J R Treatment of Dementia Paralytica Comparative Study of Combined Artificial Hyperpyrexia and Tryparsamide versus Therapeutic Malaria J A M A 107 1031 1036 (Sept. 26) 1936

15 Dennie C C Polsky Morris and Lemoire A N Hyperpyrexia Produced by Hot Bath in the Treatment of Syphilis J Missouri M A 33 112 (Jan.) 1936

16 Kemp J E and Stokes J H Fever Induced by Bacterial Proteins in the Treatment of Syphilis Observations in Sixty Five Cases J A M A 92 1737 1741 (May 25) 1929

although slower in making their appearance, have been more permanent. Each method has a few advantages and similar disadvantages which are about equal. The morbidity and mortality are also similar when the treatments are given by an adequately trained corps of attendants under the guidance of an experienced director. In the hands of those who are inexperienced, either method of treatment is attended with unpleasant complications or death. To date, the results obtained with artificially produced fever are not superior to those obtained with malarial therapy.

The problem now confronting the syphilotherapist is the creation of a procedure that will determine the status of the patient's defensive mechanism. At the present time it requires at least four years of treatment and observation, and possibly longer, to make such an appraisal. The evidence accumulated from a large series of cases indicates that the degree of activity of the immunologic mechanism determines the course the disease will pursue, and when it is possible to determine that a sufficient defensive reaction is lacking early in the disease, the immediate addition of efficient non-specific measures should prevent the subsequent development of many of the serious sequelae of syphilis.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION
OF THE FOLLOWING ARTICLE

HOWARD A. CARTER, Secretary

PHYSICAL THERAPY IN INFANTILE PARALYSIS

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Infantile paralysis (poliomyelitis) in epidemic form is more prevalent during the late summer and early fall in this country than at any other time of the year. It would therefore seem pertinent to discuss the early orthopedic, nursing and physical measures which are so necessary in preventing crippling and in restoring as much function as possible in each case. It must be remembered that some of these children die from the disease in the early stages, some of them are not paralyzed at all, some of them are partially paralyzed and some are almost totally paralyzed. The paralysis varies with each patient. A few of the paralyzed show no power of recovery whatever, but the majority may recover more or less muscular power and a complete recovery is not uncommon.

Lovett in his monograph divided the disease into three stages, first, second and third.

THE FIRST STAGE

The first stage, or the acute stage, lasts from the onset until muscle and nerve pain and tenderness disappear. It is during this stage that all the resources of the attending physician, nurse and orthopedic surgeon are so often needed. Treatment during the febrile portion of the acute stage is mainly that of medical and nursing care, but as soon as the fever has subsided the attending physician should not consider that convalescence has begun, as is true in many other conditions, because by no possible chance can the lesion in the spinal cord be healed, since this is a matter of several weeks (eight at least). It is during this time

that the patient is very apt to be exquisitely tender in his legs, calves, thighs, hips, back and also in the adductor region of the shoulders. The tenderness is not always confined to the paralyzed members. There may be as severe pain and sensitiveness in the unparalyzed extremities. Patients who are very sensitive in these parts may assume protective positions of flexion in order to relieve pain and thereby develop deformities. To prevent such conditions occurring, properly covered and padded wire splints must be applied to hold the extremities in the position of comfort. One will find that after a few days the deformities will gradually straighten out and, as they do so, the wire splints can be straightened as the tenderness disappears. Sedatives may be necessary. On no account should efforts be made to stretch out flexed limbs while they are tender. The use of hot packs or, better still, if the patient can stand moving, a deep hot bath for a few minutes each day are the two best forms of heat to be used in relieving and relaxing the sensitive extremities. Dry heat in the form of lamps or diathermy has no advantage over these methods. As the soreness disappears, flexed limbs will gradually straighten out and the splints may be adjusted accordingly. The splints are useful in relieving pain and preventing deformities.

There are a few simple procedures for eliciting sensitiveness. In the lower extremity gentle straight leg raising by the examiner will produce pain in the leg. Attempts at passive dorsal flexion of the foot will produce pain in the calf, deep slow pressure of the calf muscles, thigh muscles and hip muscles will elicit pain if these are still sore. In the shoulder, attempts at passive abduction or pressure on the axillary groups of muscles are the two methods for eliciting tenderness here.

No massage or exercises should be started during the stage of tenderness, since they do nothing but increase the pain and delay favorable progress. Absolute rest in bed and daily hot packs or hot baths at a temperature of 105° F. must be insisted on, since these are more effective than any other form of therapy. The patient will often move his extremities a little in the hot bath without detriment.

THE SECOND STAGE

As soon as all the signs of tenderness have disappeared, rehabilitation should be begun by an expert physical therapy technician who has a complete knowledge of muscle function. Deformities must be prevented if possible by proper attitudes of the patient and careful splinting of the extremities and back if necessary. The physical therapy technician should make a complete muscle examination in order to evaluate the loss of power in each muscle or each group of muscles as the case may be. The tests are necessarily rough ones but serve the purpose very well. The muscle function tests are based on gravity and the key is as follows:

Normal	Against gravity plus normal resistance
Good	Against gravity plus resistance under normal
Fair	Against gravity without resistance
Poor	Horizontal plane eliminating gravity
Trace	Not able to carry through arc of motion but contraction can be felt by finger
No power	No contraction can be felt

The muscle power is charted as shown in the accompanying illustrations and from this chart one gets a

be taught to get out of a chair, to walk and go up and down stairs. Being able to do these three things makes him independent.

The third stage is usually represented by the end of the maximum recovery of power of muscles and has been arbitrarily placed at two years. It is not uncommon for muscle power to go on increasing for many years after this. It is during this stage that fixed deformities must be relieved by operative measures such as arthrodeses and tendon transplantations. During the period of immobilization after each procedure, a physical therapy technician should teach the patient how to exercise the limbs to improve function and how to exercise the transplanted muscle so that it will take on the function of the muscle for which it is substituted.

It must be remembered that in the rehabilitation of an "infantile," a physical therapy technician plays a large part, so that it is of vital importance that the technician employed should be well trained in the

Name				Record No.			
Characteristic gait							
LEFT				RIGHT			
Date	Date	Date	Date	Date	Date	Date	Date
				Faci t			
				Neck			
				Stern mastoid			
				Suprathyloid			
				Infrathyloid			
				Deep flexors			
				Back			
				Anterior) Abdominal (Antero			
				Lateral) Legs (Lat rel			
				Calf) (Calf			
				Thigh) Measurements (Thigh)			
				Length) (Length			
				Gluteus maximus			
				Ilio psoas			
				Sartorius			
				Tensor fasciae latae			
				Hip abductors			
				Hip adductors			
				Inward rotators			
				Outward rotators			
				Quadriceps			
				Inner) Hamstrings (Inn			
				Outer) (Out-			
				Gastrocnemius			
				Tibialis anterior			
				Tibialis posterior			
				P peroneus longus			
				Peroneus brevis			
				Extensor digitorum longus			
				Extensor digitorum brevis			
				Extensor hallucis proprius			
				Flexor digit rum longus			
				Flexor digitorum brevis			
				Flexors of the proximal phala gen			
				Flexo hallucis longus			
				Flexor hallucis brevis			

against gravity and friction, these should be removed. Exercises given in a pool or tank of warm water eliminate friction. It is very simple to construct a house tank of galvanized iron about 2 feet in depth, 4 feet in width and 6½ feet in length. Gravity may be eliminated by having the moves made parallel to the table.

The strong muscles must not be treated at the expense of those that are weakened. As soon as a muscle shows the first sign of flagging, it should be rested. During the early part of the convalescent stage, complete rest must be insisted on. The length of time of rest depends on how fast recovery takes place and on the amount of paralysis present. Braces and splints must be worn to keep the extremities in the most favorable position for recovery and also to relieve stretching of paralyzed muscles. The duration of the physical treatment should be indefinite, i. e., it must be continued as long as recovery can be demonstrated.

Early walking should be discouraged. For a moderately paralyzed patient whose morale is low, simple walking splints may be applied and the patient allowed to walk a little each day, but he should not be allowed to get fatigued. It must be remembered that walking does not increase the strength of the muscles. If it is obvious that the patient is not going to make any recovery whatever, that is, complete paralysis of the lower extremities, he should be taught to walk with braces and crutches. If a patient has one good hand, a good arm and good back muscles he can

[illegible]

List of muscles on the back of the chart.

treatment of these cases. If it is possible, the patient should have the attention of an expert technician who can teach some member of the patient's family the necessary exercises and then check up on them from time to time. The Council on Physical Therapy believes that electricity has no place in the treatment of infantile paralysis.

234 Marlboro Street

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT
PAUL NICHOLAS LEECH Secretary

GONOCOCCUS FILTRATE (CORBUS-FERRY) NOT ACCEPTABLE FOR N N R

Since 1931, the Council has considered from time to time this product, which is a gonococcus bouillon filtrate proposed for the treatment of gonorrhea and marketed by Parke, Davis & Co. Two preliminary reports have been published (THE JOURNAL, Feb 13, 1932, p 554, and May 18, 1935, p 1825), each time (at the request of the firm, which has always shown a commendable desire of cooperation) postponing consideration to await the development of more convincing evidence of the therapeutic value of the product. The last report concluded

While the evidence submitted since publication of the first preliminary report of the Council is favorable to the use of the product the Council feels that because of its inconclusive nature it is not sufficient to warrant the acceptance of the product at this time. The Council has therefore reaffirmed its previous decision postponing consideration of Gonococcus Filtrate (Corbus-Ferry) to await the development of confirmatory evidence of its clinical value.

In the meantime the firm has made efforts to collect the needed clinical data and has abstained from promoting the product actively. At one time objection was made by the Council to a circular letter which was sent to the medical profession to gain information concerning the use of the product. The Council felt that the wording of this circular was of a promotional nature and the firm acknowledged the justice of the Council's contention. The Council has given consideration to the product at various times in this interim and at no time has found that the available evidence has justified changing the experimental status of the drug.

The occasion of the Council's latest consideration of the product was the presentation by the firm of a booklet with references to recent literature concerning Gonococcus Filtrate (Corbus-Ferry). The Council's referee made the following report on the literature cited by the firm, together with other reports which were available.

Cummings and Burhans (THE JOURNAL, Jan 19 1935, p 181) reported the results in 124 cases, in most of which, 110, local treatment was used as well. The number of injections employed was usually from seven to ten, one patient (17) and one (13), with an average of 5.3 in the 110 private cases. The organisms disappeared in one day up to sixteen weeks, the average being five weeks. They reported a phenomenal response to the therapy and except for stubborn adnexal involvement in males, which is really an extension and not a complication, that there were no complications. They felt that the use of the filtrate in intradermal injections in large doses as a diagnostic or provocative agent demonstrating dormant infections is a milestone.

B C Corbus has written several articles on the subject. In 1935 (ILLINOIS M J 67 521 [June] 1935) he made the statement that in his experience either a negative or a positive history of gonorrhea infection together with a positive allergic test is evidence of a neisserian infection. This allergic test remains constant throughout the duration of the infection. He felt that it is possible that the test will have value in determining when a patient is cured. In another article (J UROL 35 112 [Jan] 1936, abstr THE JOURNAL, Feb 29, 1936, p 743) he describes the cutaneous test for diagnosis. He thinks that the gonococcus bouillon filtrate contains two specific substances. One injected intradermally produces a gonococcus antitoxin. This can be destroyed if the filtrate is heated in an autoclave at 15 pounds pressure for fifteen minutes for two periods, with average temperature from 115 to 120 C. There remains the second substance capable of giving a cutaneous response in persons with gonorrhea. This test is founded on an allergic base. He states that it leaves with the disappearance of the gonococcus and may help to clarify many previously mistaken diagnoses and, in addition, furnish a specific test for a clinical cure. More recently before the Southern Medical Society (SOUTH M J 29 710 [July] 1936), under the formidable title "An Evaluation of the Gonococcus Bouillon Filtrate, A Statistical Report," Corbus analyzed questionnaires sent out to 850 physicians. There were 478 replies, 40 per cent favorable, 12 per cent unfavorable and

5 per cent doubtful. It is not stated what the remainder felt. He concluded from this report that with local treatment best results were achieved. Chronic infections in men and acute infections in females responded best. Naturally a report of this type must be received with great reserve. In the discussion of the paper, Dr Deakin of St. Louis disagreed with the results [Dr Otto J. Wilhelm of the same city disagreed with Dr Deakin]. His results, both in clinic and in office practice, were that any foreign protein served as well as the filtrate. Moreover, in acute cases with either there was an aggravation of symptoms and further posterior involvement in the male.

J M Townsend (Kentucky M J 33 463 [Oct] 1935) made a short report on thirty-seven cases. Local treatment was used as well. There were two complications, an acute epididymitis and one small periurethral abscess.

A L Stockwell (J Missouri M A 32 387 [Oct] 1935), from a report of twenty cases, concluded "The newer biological products have not produced any better results in my hands than modern classical therapy."

The reference to J G Strohm (Northwest Med 34 13 [Jan] 1935) cited by Parke, Davis & Co. is valueless.

B P Storts used the product in ophthalmia neonatorum (Arch Pediat 52 567 [Aug] 1935). It was limited to one case, and local treatment as well was employed. The Council's referee has seen many of these cases respond as rapidly with local treatment alone.

H M Spence (J Oklahoma M A 28 442 [Dec] 1935) reported the results in fifteen cases followed regularly in which the patients were desirous of getting well. He found the treatment inferior to the Pelouze routine. He had never had so many complications in such a short time as when using this form of therapy (swelling of the penis and urethra, with phlebitis of the dorsal vein, acute prostatitis, acute epididymitis, hematuria, tenesmus, and elevation of temperature).

Probably one of the most complete and scholarly reports on the Corbus-Ferry filtrate has been made by Rogers Deakin (THE JOURNAL, Sept 19 1936, p 954), from the Genito-Urinary Clinic of the Washington University School of Medicine. It comprised 112 cases of acute or chronic gonorrhea. The author attempted to correlate the gonococcus complement fixation reaction on the patient's blood to the results. The local treatment was the same for the two groups. The routine suggested by Parke, Davis & Co. and Dr Corbus was very carefully carried out. It was found that acute gonorrhea does not do as well with the filtrate as without. The poorest results were achieved in chronic gonorrhea with a positive gonococcus complement fixation and best results were seen in chronic gonorrhea with a consistently negative complement fixation, though it must be added that even these results were no better than those shown by cases in which no filtrate was used. Table 3 from Deakin's report is offered as sufficient evidence of the lack of value of the product.

TABLE 3 (of Deakin's report)—Percentages of Satisfactory Clinical Results

Type of Case	Complement Fixation	No of Therapy Cases	No of Cases	Per centage	
Acute and chronic		82	Filtrate	52	46
			No filtrate	30	73
Acute		46	Filtrate	33	42
			No filtrate	13	61
Chronic		36	Filtrate	19	32
			No filtrate	17	82
Acute	Positive	21	Filtrate	18	23
	Negative	25	No filtrate	3	100
Chronic	Positive	15	Filtrate	15	53
			No filtrate	10	50
	Negative	21	Filtrate	8	13
			No filtrate	7	86
			Filtrate	11	82
			No filtrate	10	80

MacKenna, Goldgader and Fishberg (M Times 67 232 [July] 1936) found that the filtrate plus routine local treatment gave no better results than routine treatment alone. It did not prevent complications or lessen their severity. Moreover, it proved of no value in determining cure.

From its consideration of the foregoing review of recent literature and in the light of the history of its previous considerations, the Council declared Gonococcus Filtrate (Corbus-Ferry) (Parke, Davis & Co.) not acceptable for N N R.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JANUARY 1, 1938

CHRONIC NONSPECIFIC THYROIDITIS

Isolated cases of chronic thyroiditis of tuberculous, syphilitic or parasitic origin are not rare. Chronic nonspecific thyroiditis, however, is of special interest because of the obscure etiology and because of its possible relationship to the function of the gland. Riedel¹ in 1896 described a patient with the physical signs of a malignant growth of the thyroid, who recovered following the removal of a small piece of thyroid tissue. At operation the gland was discovered to be stony hard and with numerous adhesions to the surrounding tissues. The adhesions had the consistency of leather and bound the gland down so firmly as to make its removal well nigh impossible. Microscopic examination of the removed tissue revealed round cell infiltration of the normal gland tissue, with the disappearance of the latter and the formation of replacement fibrosis. Riedel called the condition eisenharte strumitis—iron-hard strumitis. Later he was able to add more cases of the same type. Following Riedel's description, reports of cases of nonspecific thyroiditis appeared under a variety of names, such as inflammation chronique primitive, canceriforme (Tailhefer, 1898), degenerescence fibreuse du corps thyroïde (Ricord, 1901), primary chronic inflammation (Berry, 1901), thyroidite ligneuse (Delore and Alamartine, 1911) and benign granuloma of the thyroid (Heyd, 1929).

In 1912 Hashimoto² described four cases of chronic inflammation of the thyroid, to which he gave the name struma lymphomatosa. He carefully differentiated his cases from lymphosarcoma, tuberculosis, syphilis and hyperthyroidism. Among the features which differentiate this condition from that of Riedel's struma are its exclusive appearance in the female sex, the fact that all patients were past 40 years of age and the absence of any record of preceding infection. The thyroid was hard, but adhesions to the surrounding

tissues were absent. The patients showed a pronounced tendency to myxedema, both before the operation and after the operation. The chief microscopic appearances in all four cases included formation of numerous lymphatic follicles, atrophy of the acinar epithelium and absence of the colloid, extensive proliferation of connective tissue and diffuse round cell infiltration. Ewing considered the type described by Hashimoto as a benign granuloma of the thyroid and the first stage of Riedel's struma. This view, however, was not accepted by a number of observers. Lee³ observed twelve cases of nonspecific thyroiditis among 1,800 strumectomies performed at the Presbyterian Hospital, New York. Nine of these belonged to the fibrous type described by Riedel and three to the lymphoid type of Hashimoto. Comparison of the two types led Lee to believe that they represent two distinct entities. He was able to collect from the literature reports of twenty-six cases of Hashimoto's disease and ninety of Riedel's struma. The former group contained only females, while in the latter there were no less than 32.2 per cent of males. Graham and McCullagh⁴ reported four cases from the Cleveland Clinic "corresponding in every essential detail with those reported by Hashimoto." These authors emphasize the persistent and distressing huskiness of the voice, slow convalescence after operative intervention, and a tendency to hypothyroidism. They suggest the administration of thyroxine or desiccated thyroid to hasten recovery, and they state that this has been beneficial in two of their cases and in one of Hashimoto's. In analysis of the cases collected from the literature, Lee pointed out that the involvement of the thyroid was diffuse and bilateral in all the cases of Hashimoto's type and in only 70 per cent of Riedel's type. In all the cases of the lymphoid type the process was limited by the capsule, with at the most only adhesions to the trachea, whereas in 80 per cent of the cases of fibrous type there was diffuse cervical infiltration.

In an analysis of 104 cases of nonspecific thyroiditis collected from the literature, Graham⁵ found that, while the involvement of the thyroid was bilateral in only 50 per cent of Riedel's cases, it occurred in 100 per cent of Hashimoto's. Diffuse cervical cellulitis was present in 78 per cent of cases of Riedel's type and was entirely absent in Hashimoto's type. Post-operative hypothyroidism occurred in 58 per cent of Hashimoto's group and in only 19 per cent of Riedel's group. Pathologic observations of the cases reported by Hashimoto and of those reported by Graham and McCullagh were strikingly similar. On gross examination the thyroid presented a uniform bilateral enlargement of both lobes and the isthmus. The

1 Riedel B. M. C. L. Die chronische zur Bildung eisenharter Tumoren führende Entzündung der Schilddrüse. Verhandl. d. deutsch. Gesellsch. f. Chir. 25: 101, 1896.

2 Hashimoto H. Zur Kenntnis der lymphomatösen Veränderungen der Schilddrüse (Struma lymphomatosa). Arch. f. klin. Chir. 97: 219, 1912.

3 Lee J. G. Chronic Nonspecific Thyroiditis. Arch. Surg. 31: 922 (Dec.) 1935.

4 Graham Allen and McCullagh E. P. Atrophy and Fibrosis Associated with Lymphoid Tissue in the Thyroid. Struma Lymphomatosa (Hashimoto). Arch. Surg. 22: 543 (April) 1931.

5 Graham Allen. Riedel's Struma in Contrast to Struma Lymphomatosa (Hashimoto). West. J. Surg. 39: 681 (Sept.) 1931.

capsule was intact and was not adherent to overlying structures. There were no nodules, tumor masses, adenomas, cysts, areas of calcification, abscesses or areas of necrosis. On microscopic examination, Graham and McCullagh found in their cases a well marked atrophy and degenerative changes in the epithelium, marked diminution in colloid material, replacement fibrosis, extensive diffuse lymphoid infiltration, localized areas of lymphoid tissue with hyperplastic germinal centers, fibrous thickening of the capsule and marked increase of the interlobular and intralobular connective tissue.

The etiology of both types of nonspecific thyroiditis remains obscure. Ewing's suggestion that struma lymphomatosa is the early stage of Riedel's struma is not acceptable in view of Graham's arguments. It would be particularly difficult to reconcile the fact, as Graham points out, that the early stage should occur late in life and the late stage in early life. The anatomic picture of Riedel's struma, with its extensive involvement of the tissues of the neck, suggests a more nearly typical inflammation, perhaps of a local character. Hashimoto's disease, on the other hand, with its uniform diffuse histologic picture, suggests an end process, result of some general constitutional state. The resemblance the lymphocytic infiltration bears to that found in hyperthyroidism suggests to Graham the possibility that these cases were preceded by hyperthyroidism which was not observed. According to this suggestion, struma lymphomatosa would then represent "a burnt-out" toxic goiter.

THE PATHOGENESIS OF HYPERTENSION

Until recently, the possible role of the kidney in the pathogenesis of hypertension had been the subject of much controversy. In 1932 Goldblatt and his collaborators published the first of a series of studies,¹ since confirmed by others, showing conclusively that the kidney plays a special part in the production of high blood pressure.²

1 (a) Goldblatt Harry Lynch James Hanzal R F and Summer ville W W. Experimental Hypertension Due to Renal Ischemia. *Bull Acad Med Cleveland* 16 6 1932. (b) Studies on Experimental Hypertension I. The Production of Persistent Elevation of Systolic Blood Pressure by Means of Renal Ischemia. *J Exper Med* 59 347 (March) 1934. (c) Goldblatt Harry. The Pathogenesis of Experimental Hypertension Produced by Renal Ischemia. *Proceedings of the Central Society for Clinical Research Chicago* Nov 6 1936 abstr. *J A M A* 108 675 (Feb 20) 1937. (d) Goldblatt Harry Gross Jerome and Hanzal R F. II. The Effect of Resection of Splanchnic Nerves on Experimental Renal Hypertension. *J Exper Med* 65 233 (Feb) 1937. (e) Goldblatt Harry. III. The Production of Persistent Hypertension in Monkeys (Macaque) by Renal Ischemia. *ibid* 65 671 (May) 1937. (f) Keyes J E L and Goldblatt Harry. IV. Clinical and Pathological Studies of the Eyes. A Preliminary Report. *Arch Ophth* 17 1040 (June) 1937. (g) Goldblatt Harry. V. The Pathogenesis of Experimental Hypertension Due to Renal Ischemia. *Proceedings of the American College of Physicians* April 19 23 1937. *Ann Int Med* 11 69 (July) 1937. (h) Goldblatt Harry and Kahn J R. The Effect of Constriction of the Aorta at Various Levels. *Proceedings of the Central Society for Clinical Research Chicago* Nov 5 6 1937. (i) Goldblatt Harry and Wartman W B. VI. The Effect of Section of Anterior Spinal Nerve Roots on Experimental Hypertension Due to Renal Ischemia. *J Exper Med* 66 527 (Nov) 1937.

2 An Investigation into the Cause of Hypertension. editorial. *J A M A* 102 1610 (May 12) 1934. Experimental Hypertension. *ibid* 105 286 (July 27) 1935. The Role of Renal Ischemia in Hypertension. *ibid* 107 1474 (Oct 31) 1936.

A century ago Richard Bright suspected a relation between pathologic changes in the kidney and vascular disease. He recognized that cardiac enlargement of extrinsic origin was frequently associated with renal disease. More recently, the arteriolar sclerosis frequently found in the kidney in hypertension was regarded as part of a process affecting the small blood vessels generally, but it was not considered of primary significance in the origin of hypertension. Some investigators, however, have insisted on a probable renal origin for hypertension, notably Fahr³ and Volhard,⁴ and numerous experiments⁵ have been performed to test this hypothesis. Few resulted in persistent hypertension, none reproduced the characteristic reduction in the caliber of the renal arterioles, and for almost every type of experiment different workers obtained contradictory results.

Goldblatt and his co-workers have definitely focused attention on the probable primary importance of the kidneys in the pathogenesis of vascular hypertension. Using a special clamp, they constricted in various degrees the main renal arteries of dogs and monkeys, thus reproducing the functional effect of constriction or organic narrowing of the arterioles. The experimental constriction of only one renal artery caused a temporary hypertension lasting for weeks or months. On constriction of both main arteries to the kidneys, the increased vascular tension induced has lasted for five years in some animals. By varying the degree of narrowing of the arterial lumen, hypertension of the benign type with little or no functional disturbance in the kidney, or of the malignant type with definite functional renal damage, could be produced at will. These results have been confirmed by many investigators.⁶

At first Goldblatt suggested two possible mechanisms for this phenomenon, both originating in the ischemic kidney: (1) reflex nervous stimulation of the general vasomotor apparatus, (2) a humoral mechanism due to some substance either produced anew by the ischemic kidney or accumulating in the blood as a result of failure of elimination or in some unknown way. The hypothetical substance might act on the vasomotor nerves or their endings, directly on the smooth muscle of the arterioles, indirectly by stimulating endocrine organs known to produce pressor substances, or synergistically with these principles themselves. Many experiments by various workers have since eliminated a possible nervous mechanism. Denervation of the kidneys,⁷ section of the splanchnic

3 Fahr T. *Pathologische Anatomie des Morbus Brightii*. Handb d spez path Anat u Histol 6 156 1934.

4 Volhard F and Fahr T. *Die Brightsche Nierenkrankheit*. Berlin Julius Springer 1914. Volhard F and Suter F. *Nieren und ableitende Harnwege*. Handb inner Med Berlin Julius Springer 1931 vol 6 part 2.

5 These are summarized by Goldblatt.^{1c}

6 Space limitations prevent the listing of the necessary thirteen references; these may be found in the bibliography of Goldblatt's paper.^{1c}

7 Page I H. Relation of Extrinsic Renal Nerves to the Origin of Hypertension. *Am J Physiol* 112 166 (May) 1935. Collins D A. Hypertension from Constriction of the Arteries of Denervated Kidneys. *ibid* 116 616 (Aug) 1936.

nerves and lower thoracic sympathetic ganglions,^{1d} section of the anterior nerve roots,¹¹ and even total thoracic and abdominal sympathectomy, including cardiac denervation,⁸ all have failed to prevent or appreciably to ameliorate the hypertension. Recently it has been shown that constriction of the artery of a transplanted kidney, free of any possible nervous connection, leads to increase in blood pressure.⁹ However, these results do not controvert those obtained by operations on the nervous system of hypertensive human beings. In the experimental animal rigid clamps remain applied to the main renal arteries, in the human being the arteriolar constriction in the kidneys, when this is not due to fixed organic changes, might tend to relax on section of the vasomotor nerves. It has been suggested that, in the relatively small number of patients in whom favorable results have been obtained by this method, the benefit derived may be due to improved circulation through the kidney and not to general vasodilatation in the area affected.¹²

Subsequent evidence supports the humoral thesis. Goldblatt has shown that bilateral nephrectomy, though followed by uremia, does not produce hypertension. Nor does constriction of the main renal arteries if the main renal veins are occluded at the same time. But complete occlusion of both renal arteries alone does lead to hypertension. When hypertension follows constriction of only one renal artery, release of the clamp or removal of the affected kidney is followed by a fall of the pressure to normal. Removal of bilateral clamps in animals with hypertension also causes a prompt drop of the pressure to normal. An extract of ischemic kidney contains more pressor substance than that of a normal kidney.¹⁰ Finally, Goldblatt^{1c} has demonstrated that removal of both adrenals abolishes or prevents the hypertension produced by constricting the renal arteries. The administration to adrenalectomized dogs of sodium chloride and sodium citrate or bicarbonate does not affect this result, injection of adrenal cortex extract leads to development of moderate hypertension in some animals. The presence of a small fragment of one adrenal cortex, barely sufficient to maintain life, permits the rise in blood pressure.¹² The adrenal medulla plays no part in this phenomenon.^{1b} These experiments indicate that surgical or radiologic interference with the adrenals in hypertensive human beings is certainly unwarranted.¹² Obviously, it would be

undefensible to remove or destroy all of both adrenals, and any less drastic procedure would be ineffective.

The method introduced by Goldblatt has led to the elucidation of phenomena that had baffled investigators for generations and to the discovery of others previously unsuspected.

Current Comment

THE FUTURE OF PATHOLOGY

In his presidential address before the American Society of Clinical Pathologists, Kracke¹ reviewed some of the principal factors that affect pathology as a specialty and may influence it in the future. Perhaps the most important element entering into its future is its economic status. Most pathologists today, he points out, are employed on either a part time or a full time salary basis. Many hospital executives seem to hold the view that the department of pathology is merely another administrative unit and fail to realize its place as a highly specialized professional activity. The proposed provision of laboratory service by various governmental agencies needs, Kracke believes, careful consideration. Although in most instances such services have been highly successful and satisfactory, the effect of the socialization of laboratory and pathologic procedures on other aspects of medical care has not been given sufficient thought. Such changes may in fact be only the forerunner of socialization in the other branches. Furthermore, the employing by many practicing physicians of nonmedical laboratory workers to carry on this phase of practice may accelerate the processes already evident. There are additional elements influencing the field of pathology today. Many physicians fail to utilize laboratory diagnostic procedures in their medical practice as thoroughly as is desirable. The widely prevalent attitude that meager training is sufficient for laboratory and pathologic work is serious. Kracke feels that there is a decrease in the number of qualified young physicians choosing this specialty and that this tendency is accelerated perhaps by the ever increasing emphasis in medical education on training in pathology for those who practice in clinical specialties. While this point of view should be encouraged, it should not result in the elimination of the specialty of pathology as a life work. On the whole, however, Kracke is hopeful of the future of pathology and believes that members of this specialty should take an active part in organized medicine and should take more interest in the problems of clinical medicine. The warning note sounded by Kracke should not pass unheard. Modern scientific medicine has developed through pathology, and a scientific hospital has pathology as the heart of the institution. A depreciation in the status of pathology as a branch of medicine will eventually lead to a deterioration in the quality of medical service.

8 Freeman N. E. and Page I. H. Hypertension Produced by Constriction of the Renal Artery in Sympathectomized Dogs. *Am Heart J* 14 405 (Oct.) 1937. Alpert L. K., Alving A. S. and Grimsom K. S. Effect of Total Sympathectomy on Experimental Renal Hypertension in Dogs. *Proc. Soc. Exper Biol. & Med.* 37 1 (Oct.) 1937.

9 Blalock Alfred and Levy S. E. Studies on the Etiology of Renal Hypertension. *Ann Surg* 106 826 (Nov.) 1937. Glenn Frank, Child C. G. and Heuer G. J. Production of Hypertension by Constricting the Artery of a Single Transplanted Kidney. *Experimental Investigation* *ibid* p 848.

10 Harrison T. R., Blalock Alfred and Mason M. F. Effects on Blood Pressure of Injection of Kidney Extracts of Dogs with Renal Hypertension. *Proc. Soc. Exper Biol. & Med.* 35 38 (Oct.) 1936. Prinzmetal Myron and Friedman Ben. Pressor Effects of Kidney Extracts from Patients and Dogs with Hypertension. *ibid* p 122.

1 Kracke R. R. The Future of Pathology. *Am J Clin Path.* 7 347 (Sept.) 1937.

GONORRHEA AND SULFANILAMIDE

In view of the widespread interest in sulfanilamide and related compounds in the treatment of gonorrhea, the work of Johnson and Pepper¹ on this subject is of interest. Twenty-four patients were given a benzyl sulfanilamide (*p*-benzyl-amino-benzene-sulfonamide), a drug as yet not on the market in this country, and seventy-five were given sulfanilamide (thirteen were given courses of both drugs). Of the twenty-four patients given this benzyl sulfanilamide, fourteen were treated for ten consecutive days with a minimum ten day dosage of 600 grains (40 Gm). Only two of the entire group seemed to be improved. For the seventy-five patients given oral daily divided doses of sulfanilamide, an average of 80 grains (5 Gm) was given for two or three days, followed by 60 grains (4 Gm) for from two to four days, with subsequent reduction to between 30 and 45 grains (2 and 3 Gm). Of the sixty-four patients of this group seen sufficiently long to analyze the results, more than half represented failures, based on an arbitrary ten day standard. The observations of other workers, however, on the frequency of development of complications, were corroborated and only eight of the twenty-seven cases of anterior urethritis became posterior. Two cases of epididymitis and one of periurethral abscess developed while on treatment. Fifty-five per cent of the sulfanilamide group and 50 per cent of the benzyl sulfanilamide group showed toxic symptoms, including malaise, headache, dizziness, palpitation, cyanosis and dyspnea in the majority. As a result of the somewhat disappointing observations the authors feel this type of therapy should not be employed in the routine treatment of outpatient gonorrhea. The danger of the toxic reactions is not offset by the percentage of cures. Furthermore, unless patients are carefully warned that rapid relief of symptoms does not constitute a cure, there will be a large increase in carriers of the gonococcus loosed on the public. This work represents an additional argument for the careful administration of this group of drugs, since they appear to be of considerable value in some cases of the disease.

INTRAVENOUS AMINO ACID FEEDING

Elman¹ of the department of surgery at Washington University School of Medicine prepared what he designates as a complete mixture of amino acids by hydrolyzing purified casein, to which hydrolysate 2 per cent tryptophan was added. The resulting mixture was dissolved in Ringer's solution and filtered. The filtrate (pH 5.8) was light amber in color and in his hands was not anaphylactogenic for guinea pigs. Dogs were rendered severely anemic by hemorrhage, and the regeneration of serum proteins followed. Dr Elman observed that a more rapid and complete regeneration of serum proteins took place in dogs treated with an intravenous injection of his complete amino acid mixture plus dextrose than in control dogs injected with dextrose alone. Less than 10 per cent of the injected amino

acids were lost through the kidneys. From these observations he concluded that intravenously injected amino acids are utilized in the synthesis of serum proteins. This possibility should be studied in great detail by immunochemists and with several different animal species before it is utilized clinically. Elman's work, however, justifies the hope that in time parenteral amino acid feeding may become a dependable instrument of clinical medicine.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH)

ARKANSAS

Annual Health Conference—The annual health conference of the Arkansas State Board of Health was held in Little Rock, December 9-10, in the State Capitol Building. Addresses were given by Drs. William B. Grayson, state health officer, W. Carter Williams, Nashville, health commissioner of Tennessee, Edgar W. Norris Jr., passed assistant surgeon, U. S. Public Health Service, Hot Springs National Park, and William R. Brooksher, Fort Smith, secretary of the state medical society. The directors of the various bureaus of the state department discussed the following special subjects: maternal and child health, syphilis, tuberculosis and malaria control. These programs as they applied to Conway, Phillips, Craighead and Mississippi counties were discussed by the directors of the county health units. A session was also devoted to public health nursing.

District Meetings—The Ninth Councilor District Medical Society met in Harrison, December 7, the following program was presented: Drs. Elmer E. Glenn, Springfield, Mo., "Pneumonia and Its Complications", Robert R. Glynn, Springfield, Mo., "Problems in the Treatment of Intestinal Obstructions", George F. Jackson, Little Rock, "Scabies and Impetigo", Alexander C. Kirby, Little Rock, "Present Status of Immunization", and Francis Walter Carruthers, Little Rock, "Fracture of the Wrist and Forearm".—At a meeting of the Eighth Councilor District Medical Society in Little Rock, November 24, Drs. Hugh Leslie Moore, Dallas, Texas, discussed "Pneumonia in Children", Robert L. Taylor, Conway, "The General Practitioner's Relation to Immunization", Darmon A. Rhinehart, Little Rock, "Significance of Calcifications Within the Lungs", and William T. Pride, Memphis, Tenn., "Long Labor and Its Management".

Society News—At a meeting of the Mississippi County Medical Society, November 2, the program was presented by Drs. Maecenas B. Hendrix on "The Dangers of Acute Appendicitis", Isaac G. Duncan, "Foreign Bodies in the Bladder", and Kinsey M. Buck, "Infant Feeding". All were from Memphis.—The Benton County Medical Society was addressed in Bentonville November 11 by Dr. Edward H. Skinner, Kansas City, Mo., on "Single Dose, Destructive Radium Therapy for Early Superficial and Orificial Cancers".—Dr. Gilbert J. Levy, Memphis, discussed infantile paralysis before the Jefferson County Medical Society November 5.—At a meeting of the Washington County Medical Society November 2 Dr. Carliss M. Stroud, St. Louis, spoke on "The Present Status of Allergy".—The Greene County Medical Society was addressed in Paragould November 18 by Drs. Robert H. Willett, Jonesboro, on "Deep X-Ray Therapy in the Treatment of Malignancies of the Cervix and Breast" and Wallace D. English, Cardwell, Mo., "Significance of the Tuberculin Test".

CALIFORNIA

Cancer Clinic—A cancer clinic has been organized at the Berkeley General Hospital, available to patients not totally indigent but unable to pay the full rates. Part pay patients will not be accepted unless referred by their family physicians or approved by the social service department after a careful financial investigation. The clinic will be held at the clinic building every Monday at 1 p. m. and all physicians particularly interested in the diagnosis and treatment of cancer are invited to attend.

¹ Johnson, S. Harris and Pepper, D. Sergeant. The Evaluation and Dangers of the Treatment of Gonorrhea with Derivatives of the Sulfonamide-Azo Dyes. *Weekly Roster & M. Digest* 33: 465 (Dec. 11) 1937.

¹ Elman, Robert. *Proc. Soc. Exper. Biol. & Med.* 36: 867 (June) 1937.

Symposium on Heart Disease—The San Francisco Heart Committee held its eighth annual graduate symposium November 17-18, consisting of lectures, demonstrations and individual study groups at various clinics. A public health meeting was held Thursday evening November 18 with the following speakers:

Dr. John P. Strickler, San Francisco Heart Disease as a Public Health Problem
 Dr. Wilton L. Halverson, city health officer, Pasadena, California
 Dr. Albert E. Larsen, director, medical bureau, city and county of San Francisco
 Dr. William J. Kerr, San Francisco President, American Heart Association
 A Summary of the Meeting

About 260 physicians registered from seventy-five cities and towns. Dr. Elbridge J. Best was chosen chairman for the ensuing year, Dr. Harold H. Rosenblum, vice chairman, and Dr. William W. Newman, secretary.

COLORADO

Society News—The Medical Society of the City and County of Denver was addressed December 7 by Drs. Cecil Howard Darrow on "Bronchography in Chest Diagnosis", George B. Kent, "Carcinoma of the Colon," and Joseph F. Prinzing, "Anatomic Studies in Postoperative Hoarseness."—The Pueblo County Medical Society was addressed in Pueblo November 2 by Dr. Bernard N. E. Cohn, Denver, on "Diseases Arising from Disturbed Calcium Metabolism."—Dr. Roy L. Cleere, Denver, discussed the development and activities of the state board of health before the Northeast Colorado Medical Society at its meeting in Sterling November 11.

DISTRICT OF COLUMBIA

Dr. Heyd Delivers Borden Lecture—Dr. Charles Gordon Heyd, New York, Past President of the American Medical Association, gave the annual William Cline Borden Memorial Lecture in Surgery, December 18, at George Washington University School of Medicine, his subject was "Thyroid Disease." The lectureship was established at the university in 1936 by Mrs. William Cline Borden and Dr. Daniel Le Ray Borden, wife and son of the former dean of the medical school, who died in 1934.

District Society Meetings—The Medical Society of the District of Columbia held a joint meeting with the local dental society, December 14. Dr. Wingate Todd, Henry Willson Payne, professor of anatomy, Western Reserve University School of Medicine, Cleveland, presented a paper entitled "Marring and Mending the Human Face: A Study of How Health in Infancy Affects Facial Growth." Dr. James M. H. Rowland, dean and professor of obstetrics, University of Maryland School of Medicine, Baltimore, addressed the medical society December 8 on "Making Childbirth Safer." At the meeting December 15 the speakers were Drs. Preston A. McLendon and Benjamin F. Dean Jr. on "Intussuscepted Sigmoid—Blood Dyscrasia" and Wallace M. Yater, "Pathogenesis of Auriculoventricular and Intraventricular Heart Block."

FLORIDA

Personal—Dr. James W. McMurray has been appointed director of the Broward County health unit with headquarters at Fort Lauderdale, succeeding Dr. Paul G. Shell, who has entered private practice in Tampa. Dr. McMurray was formerly director of the Gulf-Calhoun-Franklin unit with headquarters at Apalachicola.

Society News—Dr. Edward Jelks, Jacksonville, addressed the Putnam County Medical Society in Palatka, December 7, on diseases of the heart.—Dr. Noble A. Upchurch, city health officer of Jacksonville, was elected president of the Florida Public Health Association, succeeding Dr. Wilbur A. McPhaul, at its annual convention in December.

Kiwanis Clubs Favor Health Units—At the recent Florida district convention of Kiwanis at St. Augustine, a resolution was adopted making the creation of full time health service through the unit plan under the supervision of the state board of health one of the major projects of Kiwanis. The resolution suggested that the plan be recommended and sponsored before Kiwanis International as a national and international project.

GEORGIA

District Meetings—At a meeting of the Eighth District Medical Society in Valdosta, October 12, the speakers included Drs. Leo Smith, Waycross, on "Tonsils and Their Diseases", Herbert C. Schenck, Atlanta, "The Tuberculosis Problem" and George A. Traylor, Augusta, "The Physician's Place in a Malaria Control Program."—The Second District Medical

Society was addressed in Albany, October 15, among others, by Drs. Edgar G. Ballenger, Atlanta, on "Carcinoma of the Bladder."—At a meeting of the Fifth District Medical Society in Atlanta, October 7, Drs. Paul H. Ringer, Asheville, N. C., and Alfred Blalock, Nashville, Tenn., discussed "Evolution of the Treatment of Tuberculosis" and "Surgery in Diseases of the Heart" respectively.

ILLINOIS

New District Unit—The state department of health is organizing a new district health unit to include East St. Louis, Centerville, Canteen and Stites. The East Side health district will be in charge of Dr. Robert C. Farrier, who recently resigned as director of the Delta County Health Department with headquarters in Escanaba, Mich. The headquarters of the new unit will be in East St. Louis, it is reported.

Hospital News—A new \$125,000 nursery for The Cradle will be constructed in Evanston, beginning April 1. The Cradle was established in March 1923 to receive and prepare homeless babies for adoption. It has cared for a total of 3,363 babies, with only seventy-six deaths. Preliminary plans for the new building call for the erection of a modern fireproof three story structure of white limestone, roofed with slate, at the corner of Simpson Street and Ridge Avenue.

CHICAGO

Personal—Dr. Ralph L. Ferguson, formerly of the department of pathology, Ohio State University School of Medicine, has been appointed associate professor of bacteriology at Loyola University School of Medicine.

INDIANA

Society News—Rev. Alphonse M. Schwitalla, Ph.D., dean, St. Louis University School of Medicine, discussed "The Medical Profession and Social Work" before the Indianapolis Council of Social Agencies November 23.—Dr. Henry O. Mertz, Indianapolis, addressed the Carroll County Medical Society in Delphi, December 9, on prostatic disease.—At a meeting of the Johnson County Medical Society in Franklin December 8, Dr. Lacey L. Shuler, Indianapolis, discussed fractures.—Dr. Frank C. Mann, Rochester, Minn., addressed the Fort Wayne (Allen County) Medical Society in Fort Wayne December 7 on "The Physiologic and Pathologic Reactions of the Liver."—At a meeting of the Jay County Medical Society in Portland, December 3, Dr. James O. Ritchey, Indianapolis, discussed respiratory infections.

IOWA

Fracture Clinic—The first annual clinic sponsored by the fracture committee of the Iowa State Medical Society was held in Des Moines November 17. Guest speakers were Drs. Herman F. Johnson, Omaha, and Frank R. Peterson, Iowa City. Case histories and demonstrations were presented by Drs. Douglas N. Gibson, Lewis M. Overton, Verl A. Ruth, Dwight C. Wirtz and W. Eugene Wolcott, all of Des Moines. A plan is under consideration whereby each county medical society will devote one meeting a year to fractures.

Gastro-Enteritis After Eating Pie—An outbreak of gastro-enteritis in more than 300 children and employees in the Iowa School for the Deaf at Council Bluffs, November 3, has been ascribed to staphylococcal toxin, according to the state medical journal. An investigation disclosed that the onset of the symptoms began three hours after the noon meal. Every one of the patients had eaten coconut cream pie which contained a filling made from milk supplied by the dairy herd belonging to the institution. One cow in the herd had a history of mastitis and examination revealed the presence in large numbers of hemolytic *Staphylococcus aureus* in the specimens of the pie and milk. It was shown that the filling used had been allowed to stand at room temperature throughout the afternoon and overnight.

Pneumonia Control Program—The Iowa State Department of Health has instituted a plan for the control of pneumonia. According to the state medical journal, it is proposed to designate certain laboratories throughout the state as centers for the typing of pneumococci with the ultimate objective of having every county in the state equipped with facilities of typing by the Neufeld method. To this end the state department will provide each typing station with a supply of diagnostic antipneumococcal serum. The department later hopes to furnish curative serum to patients unable to pay. The journal points out that deaths from pneumonia are increasing in Iowa. In 1933 these deaths numbered 1,482, or 59.7 per hundred thousand of population, in 1936 they totaled 2,098 giving a rate of 83.9 per hundred thousand.

Society News—A symposium on Hodgkin's disease was presented by Drs Guy R. McCutchan, Council Bluffs, Royal A. Becker, Atlantic, and William S. Greenleaf, Atlantic, before the Cass County Medical Society in Atlantic October 28—Dr Byron M. Merkel, Des Moines, discussed deafness before the Jasper County Medical Society in Newton October 5—At a meeting of the Johnson County Medical Society in Oakdale, November 3, Dr Jay Arthur Myers, Minneapolis, spoke on tuberculosis—The Montgomery County Medical Society was addressed at Emerson October 7 by Drs John F. Allen and Rollin R. Best, both of Omaha, on 'Diagnostic Procedures in Pulmonary Disease' and 'Recent Conceptions in the Management of Biliary Tract Disease' respectively—Dr Milford E. Barnes, Iowa City, discussed 'The Practical Aspects of Epidemiology' before the Poweshiek County Medical Society at Grinnell October 12—Among others, Drs Austin C. Davis and Newton D. Smith, Rochester, Minn., addressed the sixty-second annual meeting of the Southeastern Iowa District Medical Society in Fairfield October 14 on 'The Heart in Disease of the Thyroid Gland' and 'Perianal Inflammatory Processes and Sinuses' respectively—At a meeting of the Woodbury County Medical Society in Sioux City, October 13, Dr Samuel M. Feinberg, Chicago, discussed 'Problems in the Management of the Asthmatic Patient'

KANSAS

New Offices for State Society—The removal of the central office of the Kansas Medical Society from the Stormont Building to the Columbian Building, 112 West Sixth Street, Topeka, has been announced. The new office will afford an outer office, two inner offices and a vault for storage of records. The change was to be made January 1.

Personal—Dr James A. Wheeler, Newton, has been appointed a member of the state board of medical examination and registration, succeeding the late Dr William C. Burnaman, Washington—Dr Jacob A. Pinsker, Wichita, has been appointed health officer of Reno County, succeeding Dr Lee O. Forney, who resigned after holding the position for nineteen years to engage in private practice.

Survey of Tuberculosis Facilities—The committee on control of tuberculosis of the Kansas Medical Society is planning a survey of tuberculosis facilities in the state with the cooperation of the Kansas Tuberculosis and Health Association, the Kansas State Board of Health and the state tuberculosis sanatorium at Norton. It is planned also to study the existing facilities in the state for private pneumothorax therapy and to encourage extension of these facilities so that many tuberculosis patients may be cared for without state hospitalization. On the completion of the survey a report and recommendations will be submitted to the governor, the board of administration and the legislature.

Society News—Dr Frank L. Feierabend, Kansas City, Mo., discussed 'Fractures with Special Reference to Skeletal Traction as a Therapeutic Measure' before the Butler-Greenwood County Medical Society at Eldorado, December 10—Dr Harold F. Spencer, Garnett, discussed undulant fever before the Anderson County Medical Society at a meeting in Garnett, November 17—The Bourbon County Medical Society was addressed in Fort Scott November 17 by Drs Delon A. Wilhams and Harry Erni, Kansas City, Mo., on treatment of peptic ulcer and tetanus respectively—Dr Donald R. Black, Kansas City, Mo., discussed 'The Specific Serum Treatment of Pneumonia' before the Clay County Medical Society, Green, November 17.

KENTUCKY

Personal—Dr Edward M. Thompson, Munfordville, has resigned as health officer of Hart County to take a similar position in Logan County. Dr William B. Turner II, Wooster, Ohio, succeeded Dr Thompson—Dr William E. Gardner, Louisville, president elect of the Kentucky State Medical Association, was the guest of honor at a meeting of the Muldraugh Hill Medical Society in Elizabethtown December 9.

LOUISIANA

Society News—The second annual New Orleans Graduate Medical Assembly will be held March 7-10—Dr Sidney J. Rozas was elected chairman of the St. Landry division of the Louisiana Society for Crippled Children at the organization meeting in Opelousas December 8—Dr Charles A. Bahn, New Orleans, was reelected president of the Louisiana Society for the Prevention of Blindness at its annual meeting November 26.

MAINE

Society News—The Portland Medical Club was addressed November 2 by Dr Francis J. Welch on 'An X-Ray Legend of Tuberculosis'—The Kennebec County Medical Society held a clinical session in Waterville November 18, speakers at an evening meeting were Drs Ralph L. Reynolds, Waterville, on 'Toxemia of Pregnancy' and Greenleaf H. Lambert, Winthrop, 'Toxemia of Pregnancy from the Laboratory Viewpoint'—At a meeting of the Piscataquis County Medical Society in Milo, November 18, Drs Harry Butler discussed 'Relation of Sphenoidal Sinusitis and Posterior Ethmoidal Sinusitis to Pulmonary Disease, Especially Bronchiectasis,' and Harold E. Pressey, 'Mechanical Medicine', both are of Bangor—The Waldo County Medical Society was addressed in Belfast, November 17, by Clarence C. Little, Sc.D., Bar Harbor, on 'Fear,' and Dr Howard L. Apollonio, Camden, 'Fractures of the Hip in General Practice'.

MARYLAND

Personal—Dr Eugene C. Peck, Oakland, health officer of Garrett County, has been appointed to a similar position in St. Mary's County, he will not make the change until a successor has been named for Garrett County, it was reported.

New Buildings for State Institutions—The state recently launched a building program for mental institutions in Maryland which will cost \$1,124,000, it is reported. The plans include a new dormitory and kitchen at the Rosewood Training School to cost \$350,000. The dormitory would provide 175 additional beds for the institution, which is crowded and has a waiting list of more than 300 feeble-minded. In addition it will provide special facilities, including space for segregating all tuberculous inmates, an admission ward for isolation of new patients for observation, an infirmary for the sick, and quarters for a dentist and a psychologist. The program includes a new building for tuberculous patients and a home for male employees at Springfield State Hospital, a new dormitory for patients at Eastern Shore State Hospital and a new dining room at Spring Grove State Hospital.

MASSACHUSETTS

Clinic Dedicated to Dr. Pratt—The cornerstone of the new diagnostic clinic at the Boston Dispensary, Boston, was laid December 5 and dedicated to Dr. Joseph H. Pratt, professor of clinical medicine, Tufts College Medical School. The building will be known as the Joseph H. Pratt Diagnostic Hospital. It has been made possible by recent gifts of William Bingham 2d, who is interested in providing a medical center at which the development of rural medicine may be planned and supervised (THE JOURNAL, Aug. 28, 1937, p. 717). The laying of the cornerstone took place on the sixty-fifth birthday of Dr. Pratt.

Society News—Dr Herrman L. Blumgart discussed 'Cardiac Pain' before the Boston University Medical Society November 29—Dr Roger I. Lee, Boston, discussed coronary thrombosis before the Lawrence Medical Club November 18—Dr Arlie V. Bock, Cambridge, discussed 'Psychiatric Trends as Seen by an Internist' before the Massachusetts Psychiatric Society December 10—At a meeting of the Greater Boston Medical Society December 7 Dr. George Bachr, New York, spoke on 'Clinical Significance of the Pathologic Alterations in Bright's Disease'—Dr Charles H. Best, Toronto, Ont., addressed the Harvard Medical Society December 7 on 'Thrombosis and the Use of Heparin'.

MINNESOTA

Dr. Penfield Will Give Judd Lecture—Dr Wilder G. Penfield, director of the Neurological Institute and professor of neurosurgery, McGill University Faculty of Medicine, Montreal, will deliver the fifth E. Starr Judd Lecture at the University of Minnesota, Minneapolis, February 2. His subject will be 'Cerebral Circulation in Epilepsy'.

Osteopath Fined for Illegal Practice—Donald J. Dunn, Worthington, pleaded guilty November 30 to a charge of practicing medicine without a license and was sentenced to pay a fine of \$250 and costs or serve four months in the Nobles County Jail. He paid the fine. Dunn is a licensed osteopath. It was revealed that he was injecting medicine and furnishing medicine to be taken internally. He had also written a number of prescriptions but had neither written the name of the patient on the prescriptions nor signed them.

Campaign on Syphilis—With the organization of a "steering committee," a plan to carry on a campaign against venereal diseases in Minnesota took definite shape. Richard Felhaber, chairman of the Minnesota State Junior Chamber of Commerce, was named chairman of the committee, and the plan has been approved by medical authorities of the state. A symposium on syphilis was conducted at the Minnesota Academy of Medicine December 8 by Drs. Henry L. Ulrich, president of the Hennepin County Medical Society, Samuel E. Sweitzer, Henry E. Michelson, John Butler and Franklin R. Wright, all of Minneapolis. Dr. Paul A. O'Leary, Rochester, discussed "Asymptomatic Neurosyphilis."

MISSOURI

Society News—Dr. Benjamin Landis Elliott, Kansas City, discussed "The Traumatic Neuroses" before the Buchanan County Medical Society in St. Joseph, November 3.—Dr. Orville H. Brown, Phoenix, Ariz., addressed the St. Louis Medical Society, November 16, on "Practical Bacterial Vaccines" and Dr. Lex G. McCutchen, St. Louis, "X-Ray Treatment for Cancer of the Cervix Using Contact Method, Also Contact Treatment of a Few Skin Lesions." The society went on its annual birthday pilgrimage to William Beaumont's grave in Bellefontaine November 21.—Dr. Chevalier Jackson, Philadelphia, addressed the Jackson County Medical Society, November 2, on "Bronchial Obstruction with Special Reference to Tumors of the Bronchi."—The St. Louis County Medical Society was addressed November 24 by Drs. Francis M. Barnes Jr., St. Louis, on "Neuroses and Their Relation to General Practice" and James Roy Compton, St. Louis, "Unusual Ovarian Tumor in a Child."—Dr. Ernest A. Pohle, Madison, Wis., discussed radiation therapy before the Kansas City Academy of Medicine, November 19.—Dr. Louis M. Warfield, Milwaukee, Wis., addressed the thirty-first annual meeting of the Tuberculosis and Health Society of St. Louis December 6 on "Public Health—Yesterday, Today, Tomorrow."

NEW HAMPSHIRE

Personal—Dr. George G. McGregor, Durham, has been appointed physician to the University of New Hampshire, Durham. He succeeds Dr. William M. Prince, who resigned to take up private practice in Newport.

NEW JERSEY

Cancer Clinic Dedicated—A new clinic for treatment of cancer and allied diseases was dedicated at the Elizabeth General Hospital December 11 in memory of Dr. James S. Green, who was associated with the hospital for many years. A bronze memorial plaque was unveiled by Dr. Green's granddaughter during the ceremony. The new clinic was made possible by a fund of \$25,000 raised by the hospital board, members of the staff, the woman's auxiliary and contributions of friends.

Society News—Dr. Edward A. Schumann, Philadelphia, addressed the Atlantic County Medical Society, Atlantic City, December 10, on "Obstetrics in General Practice."—Dr. Joseph J. Bunim and Abraham L. Greenfield, D.D.S., New York, addressed the Bergen County Medical Society, Englewood, December 14, on "The Effect of Focal Infection of the Teeth and Tonsils with Special Reference to Chronic Arthritis" and "Interpretation of Dental X-Rays and Its Relation to Systemic Infections" respectively.

NEW YORK

Hospital Head Appointed—Dr. John H. Travis, recently a medical inspector for the state department of mental hygiene, has been appointed superintendent of the Willard State Hospital to succeed Dr. Harry J. Worthing, who recently became head of Pilgrim State Hospital, Brentwood. Dr. Worthing succeeded Dr. William J. Tiffany when the latter became head of the state mental hygiene department on the retirement of Dr. Frederick W. Parsons. Dr. Travis is 48 years of age and a graduate of the University of Toronto Faculty of Medicine, class of 1911. He has served on the staffs of the Buffalo State Hospital and the Creedmoor State Hospital.

Personal—Dr. Theodore J. Culphey, pathologist at Meadowbrook Hospital, Hempstead, L. I., will serve as acting medical examiner of Nassau County in accordance with a new charter which goes into effect January 1. A permanent appointment will be made under civil service.—Dr. Raymond D. Fear, health officer of Stamford, Conn., has been appointed district health officer on the staff of the New York State Department of Health in charge of the Tompkins County district. Dr. Joseph P. Garen, Albany, assistant district health officer, has been

made district health officer with headquarters at Saranac Lake. Dr. Arthur H. Cummings, formerly at Saranac Lake, has been transferred to the Binghamton office.

New York City

Afternoon Lectures—Friday afternoon lectures at the New York Academy of Medicine will be as follows during January and February:

January 7, Dr. Rufus I. Cole	Treatment of Pneumonia
January 14, Dr. Carl Eggers	Cancer of the Gastro-Intestinal Tract (the Bulkley Lecture)
January 21, Dr. Sam Z. Levine	Recent Advances in Common Diseases of Children
January 28, Dr. Howard C. Taylor Jr.	Endocrine Therapy in Gynecology
February 4, Dr. Philip D. Wilson	What Can Orthopedic Surgery Do for the Arthritic Cripple?
February 11, Dr. Foster Kennedy	A Consideration of Nervous and Mental Disease in General Practice
February 18, Dr. William Thalheimer	Convalescent Measles and Scarlet Fever Serums: Their Value in Prophylaxis and Therapy

Annual Medical-Dental Meeting—The seventh annual joint meeting of the organized medical and dental professions of New York under the auspices of the five county medical societies and the first and second district dental societies was held December 6 at the Hotel Pennsylvania. At the morning session papers were presented by Drs. Maximilian A. Ramirez and Henry M. Feinblatt on "Oral Manifestations of Allergy" and "Oral Manifestations of Endocrine Dyscrasias" respectively. The afternoon session was devoted to a clinical meeting, at which cases were demonstrated from the New York Neurological Institute, Long Island Hospital and Queens General Hospital.

Health Centers Dedicated—Two new district health centers have recently been dedicated, the seventh and eighth in the program of the New York City Department of Health to decentralize health administration in the city. The Red Hook-Gowanus Health and Teaching Center at 250 Baltic Street, Brooklyn, was dedicated November 30 with Mayor La Guardia and Dr. John L. Rice, city health commissioner, as the principal speakers. Dr. Alfred E. Shipley, professor of clinical preventive medicine and community health, Long Island College of Medicine, presided at the ceremonies. The new center, financed by PWA funds of \$250,000, will be used as a training school in public health work by the Long Island medical college under Dr. Shipley's direction. The Astoria-Long Island City Health Center, built at a cost of \$279,723, was dedicated in October as the seventh of the series now under construction.

Pneumonia Program Widened—Dr. Wheelan D. Sutliff, recently associated with the University of Chicago as research instructor in medicine, has been appointed chief of the pneumonia service of the bureau of laboratories, New York City Health Department. Dr. Sutliff, whose appointment is temporary pending the result of a civil service examination, was formerly associated with Dr. Russell L. Cecil in the study of pneumonia serum at Bellevue Hospital and later participated in the pneumonia control program of the Massachusetts State Board of Health. A pneumonia typing station has been opened in each of the five boroughs to make possible rapid typing. The Manhattan station is operated twenty-four hours a day, Sundays and holidays included. The laboratory now has available specific serum for types I, II, V, VII and VIII and limited quantities for a few other types. The department's antitoxin farm at Otisville now has sixty-nine horses being immunized for production of serum, as compared with forty last year, and additional horses are to be procured, according to the *Quarterly Bulletin*.

Society News—Drs. Aaron S. Blumgarten and Hans W. Weisbader addressed the New York Endocrinological Society, November 24, on "Modern Concepts of Menstrual Disorders" and "Endocrine Disorders in Pregnancy" respectively.—A symposium on bronchiectasis was presented at a meeting of the New York Society for Thoracic Surgery, November 26, by Drs. Edith H. M. Lincoln and Richmond L. Moore, New York, Max Pinner and Ethan F. Butler, Ithaca.—A symposium on pulmonary tuberculosis in children was presented at a clinical session of the Tuberculosis Sanatorium Conference of Metropolitan New York, December 15, by Drs. Frederic Maurice McPhedran, Philadelphia, Robert A. Moore and Edith H. M. Lincoln.—Dr. Samuel A. Levine, Boston, addressed the Bronx County Medical Society November 17, on "Recent Advances in Cardiology."—Drs. Nathan Sobel and Louis Chargin discussed congenital syphilis at a meeting of the Bronx Pediatric Society, December 8.—Dr. Samuel Gitlow addressed the Bronx Pathological Society, November 16, on "Pentosturia."—Dr. John L. Kantor delivered a Friday afternoon lecture before the Medical Society of the County of Queens, November 19, on colitis.

OHIO

Personal—Dr Vaughn L Hartman, Medina, resigned as health commissioner of Medina County recently to become assistant health commissioner of Cuyahoga County—Dr Clare R Rittershofer was recently promoted from instructor to assistant professor of pediatrics at the University of Cincinnati College of Medicine

Organization Conference—The annual midyear organization conference for county, district and state officers of the Ohio State Medical Association was held in Columbus, October 24. Guest speakers were Drs Ralph C Williams, Washington, D C, on "The Farm Security Administration Medical Program in Ohio" and Rosco G Leland, director of the Bureau of Medical Economics, American Medical Association, Chicago, on "Policy of Organized Medicine on Group Hospitalization"

Refresher Courses—The bureau of child hygiene and maternal welfare of the state department of health recently presented refresher courses in obstetrics and pediatrics in several towns. At Greenville December 1 Dr Arthur J Skeel, Cleveland, conducted a course in obstetrics and at Springfield December 2 Dr Scott C Runnels, Cleveland, conducted a similar one. A course in pediatrics was offered at Bethel November 29 and Lebanon November 30 with Drs Elmer G Horton and Marion L Ainsworth, Columbus, as instructors

Society News—Dr Robert Louis Levy, New York, addressed the Academy of Medicine of Cleveland, December 17, on "Drug Treatment of Heart Disease"—Dr Burrill B Crohn, New York, addressed the Cincinnati Academy of Medicine, December 7, on "Regional Ileitis, Regional Colitis". Dr Irving F Stein, Chicago, was the speaker, December 14, on "Extraglandular Influences upon Ovulation, Menstruation and Labor"—Dr William Bates, Philadelphia, addressed the Toledo Academy of Medicine, December 3, on "The Diagnosis and Treatment of Nerve Root Pain as Associated with Backache and Visceral Pain"

PENNSYLVANIA

Statewide Syphilis Program—The state department of health has announced that a statewide Wassermann survey will be made early in 1938. Blood for the tests will be taken at stations designated by the department and also by private physicians without charge, according to the *Pennsylvania Medical Journal*. Containers will be furnished by the state and the tests will be made by state and city health departments. Subsequent treatment based on the results of the tests must be arranged by the patient and his physician. These plans were made with the approval of the committee on control of syphilis and venereal diseases, the board of trustees and the committee on public relations of the Medical Society of the State of Pennsylvania

Surgical Unit for State Sanatoriums—The cornerstone was laid November 18 at the state tuberculosis sanatorium at Hamburg for a new surgical unit, which will also serve the other two state sanatoriums at Cresson and Mont Alto. Dr Moses Behrend, Philadelphia, will be in charge of the Hamburg unit, which is a part of an extensive program of expansion for the tuberculosis services of the state. A new sanatorium will be built at Butler for 550 patients, facilities will be built at Hamburg for 200 additional patients, a new children's hospital and a new building for adults are planned at Mont Alto, it is said. Dr Martha Edith MacBride-Dexter, secretary of health, Harrisburg, presided at the ceremonies

Philadelphia

Society News—Drs John Eiman, Abington, Pa, and Henry C Bazett addressed the Northern Medical Association of Philadelphia, December 20, on "Water Metabolism" and "Blood Volume Changes in Their Relation to Circulation" respectively—Dr Abraham Trasoff addressed the Philadelphia Urological Society, December 20, on "The Treatment of Benign Prostatic Hypertrophy with Male Sex Hormone"

RHODE ISLAND

Society News—Dr Herbert E Harris, Providence, addressed the Pawtucket Medical Association, November 18 on "Hip Conditions in Children"—Dr Foster Kennedy, New York, addressed the Providence Medical Association, December 6, on treatment of acute skull injury

Public Lectures—The annual series of public lectures sponsored by the committee on education of the Rhode Island Medical Society in Providence began November 7 with an address by Dr Alex M Burgess on "Colds Grip and Pneumonia". Dr Charles P Fitzpatrick gave the second lecture

November 14 on "What Can Be Done About Mental Disease?" and Dr Joseph L Dowling the third November 21 on "Common Causes of Blindness"

TENNESSEE

Dr Goodpasture Receives Research Medal—Dr Ernest W Goodpasture, professor of pathology, Vanderbilt University School of Medicine, Nashville, received the research medal of the Southern Medical Association at the annual meeting in New Orleans, November 30-December 3. The award was made in recognition of his investigations of virus diseases. Dr Goodpasture graduated from Johns Hopkins University School of Medicine in 1912 and remained there in the department of pathology until 1915, when he became resident pathologist at Peter Bent Brigham Hospital, Boston. From 1917 to 1921 he was assistant professor of pathology at Harvard University Medical School and spent the following year as chief of the department of pathology and bacteriology in the University of the Philippines, Manila. Later he was director of the Singer Memorial Laboratory at the Allegheny General Hospital, Pittsburgh, and also studied in Vienna on a scholarship from the Rockefeller Foundation. He was appointed to his present position in 1924.

WASHINGTON

Society News—Dr Charles A Doan, Columbus, Ohio, addressed the King County Medical Society, Seattle, December 6, on "Newer Conception of Blood Formation and of Blood Destruction as Applied to the Medical and Surgical Treatment of Certain Human Diseases"—Drs Lawrence G Dunlap, Anaconda, Mont, and Arthur C Jones, Boise, Idaho, addressed the Spokane County Medical Society, Spokane, December 10, on "The Present Medical Situation in Europe" and "Osteomyelitis of the Frontal and Cranial Bones" respectively

GENERAL

Reunion of Former Camp Grant Hospital Personnel—Plans are under way to hold a reunion of officers, nurses and men who served at the base hospital, Camp Grant, Ill, in 1917, 1918 and 1919. Any one interested should communicate with Harold E Giroux, 841 West Barry Avenue, Chicago, Ill.

Grants for Cancer Research—The National Advisory Cancer Council made its first grants November 27 to the following investigators:

Ernest O Lawrence, Ph D, University of California, Berkeley, \$30,000 for the establishment of a cyclotron laboratory and for clinical work with special reference to cancer.

Louis F Fieser, Ph D, associate professor of chemistry, Harvard University, Cambridge, Mass., \$20,550 to be used over a three year period in his work of developing cancer producing chemicals.

Edward William Wallace, formerly of the National Institute of Health, Washington, D C, \$4,350 for use over a two year period at the University of Cincinnati in studies of radium to determine the relation of the pituitary gland to cancer.

Study of Students' Eye Problems—Plans for a study of the eye health problems of college students will be made by the eye health committee of the American Student Health Association and an advisory committee from the American Academy of Ophthalmology and Otolaryngology with the cooperation of the National Society for the Prevention of Blindness, it was recently announced. Dr Raymond W Bradshaw, Oberlin College, Oberlin, Ohio, is chairman of the eye health committee and other members of his committee are Drs Lee H Ferguson, Western Reserve University, Cleveland, Louis M Hickernell, Syracuse University, Syracuse, N Y, and Ruby L Cunningham, University of California, Berkeley. On the advisory committee of ophthalmologists are Drs William L Benedict, Rochester, Minn., LeGrand H Hardy, New York, and Harry S Gradle, Chicago. Anette M Phelan, Ph D, New York, represents the National Society for the Prevention of Blindness.

Propose Revision of Birth and Death Certificates—

The U S Bureau of the Census is making a questionnaire study among agencies and officials interested in vital statistics on a proposed revision of birth and death certificates. About 6,500 questionnaires have been sent out to state and local registrars, state and local health officers, presidents of county medical societies, coroners and others, whose opinions will be used for designing preliminary standard certificates. These preliminary forms will then be cleared through the various interested organizations. In addition, an advisory committee has been appointed to make recommendations for changes they consider advisable. Members of the committee are Louis I Dublin, Ph D, New York, Robert E Chaddock, Ph D, New York, Lowell J Reed, Ph D, Baltimore, Dr Robert Olesen of the U S Public Health Service, Washington, D C, Dr Haven Emerson, New York,

Joseph V DePorte, Ph D, Albany, N Y, and Dr Albert J Chesley, St Paul After clearance and revision the certificates will be offered for adoption by the states in 1940

Attorney Sentenced for Part in Eye Frauds—Frank Mackett Jr, Milwaukee attorney, was tried November 10-18 at Norfolk, Va, for participation in swindling a Virginia woman of \$2,500 in a fake eye treatment and sentenced to spend three years in the federal prison at Chillicothe, Ohio On another count in the indictment Mackett received a five year sentence, which was suspended on condition of good behavior Mackett was convicted on a charge of using the mails to defraud His activities were part of the countrywide eyeswinding racket which has been reported at various times in THE JOURNAL It was said that the swindlers sent to Mackett the checks which they obtained from their victims and he deposited them in banks for collection, remitting the proceeds, less 10 per cent commission, to the fake specialists (THE JOURNAL, Dec 19, 1936, p 2059) Several of the swindlers have been sentenced to prison terms in various states as a result of investigations by the U S Post Office Department The department stated that more than 100 men have been engaged in the eyeswinding racket

Annual Review of Physiology—Plans for an *Annual Review of Physiology* in which it is proposed to review developments of each year or biennium in the major fields of physiologic research have been announced by James Murray Luck, Ph D, of Stanford University, California, who will be managing editor The new series will appear under the auspices of the American Physiological Society, Inc, and the *Annual Review of Biochemistry, Ltd* The joint board of management will consist of Chauncey D Leake, Ph D, University of California Medical School, San Francisco, Walter J Meek, Ph D, professor of physiology and assistant dean of the medical school, University of Wisconsin, Madison, Carl L A Schmidt, Ph D, professor of biochemistry, University of California, San Francisco, and Dr Luck The editorial committee is as follows Dr Meek, Dr Frank C Mann, professor of pathological surgery and experimental physiology, University of Minnesota Graduate School of Medicine, Rochester, Minn, Dr Anton J Carlson, professor of physiology, University of Chicago, Dr John F Fulton, Sterling professor of physiology, Yale University School of Medicine, and Merkel Henry Jacobs, Ph D, professor of general physiology, University of Pennsylvania, Philadelphia It is expected that the first volume will appear in February 1939

Society News—The fourth annual conference on "Conservation of Marriage and the Family" will be conducted at the University of North Carolina, Chapel Hill, April 12-14 Registration will be restricted to 100 The program, now in preparation, may be obtained from Prof Ernest R Groves at the university—Dr Harry Vernon Sims, New Orleans was elected president of the Southern Interurban Gynecological and Obstetrical Society at its seventh annual meeting in New Orleans, November 30 Dr Shelby B Hinkle, Little Rock, Ark, was elected vice president and Dr Robert A Ross Durham, N C, reelected secretary—Dr Lloyd Noland, Birmingham, Ala, was elected president of the Southern Surgical Association at its fiftieth annual meeting in Birmingham, December 7-9 Dr Samuel L Ledbetter, Birmingham, was elected vice president and Dr Edward William Alton Ochsner, New Orleans, was reelected secretary—Dr Alfred C Reed, San Francisco, was chosen president-elect of the American Society of Tropical Medicine at its annual meeting in New Orleans, December 3, and Dr Mark F Boyd, Tallahassee, Fla, was installed as president Asa C Chandler, Ph D, Houston, Texas, was elected vice president and E Harold Hinman, Ph D, Wilson Dam, Ala, secretary Next year's meeting will be at the time of the Southern Medical Association meeting in Oklahoma City

Biennial Report of Cancer Society—Organization of the Women's Field Army was the chief activity of the American Society for the Control of Cancer during the years 1935-1937, according to a report for the two years issued recently The "field army" was an outgrowth of plans originated by the advisory board on public health and child welfare of the General Federation of Women's Clubs in 1933 The society having decided in 1935 to enlarge its program of lay education, transferring emphasis from medical education, plans were made to establish a nationwide organization for women Mrs Grace Morrison Poole, past president of the federation of women's clubs, became chief adviser and Mrs Marjorie B Illig lay field representative, Mrs Poole has since resigned and Mrs Illig has become national commander In the first public campaign for membership March 21-27, 1937, thirty-eight states took part and about 100,000 members were enlisted, providing a fund of \$107,000, which included some donations The report states that

physicians have helped in every possible way to make a success of the field army, being ready to plan the educational activities and responding to requests for talks, articles and radio broadcasts Work in the central office has included correspondence, publication of the society's bulletin and preparation of exhibits Four field representatives are maintained by the society, developing cancer programs in individual states These report greatly increased interest, principally shown in the response to lectures and demonstrations on cancer before medical organizations and the public Surveys have been made of cancer control facilities in Illinois, the District of Columbia, Hawaii and New York City's metropolitan area In 1935-1936 the society received \$86,114.37 and expended \$81,740.77, in 1936-1937 the receipts were \$136,283.21 and disbursements \$118,605.86

Commission on Graduate Medical Education—By authority of a resolution adopted by the Advisory Board for Medical Specialties last June a Commission on Graduate Medical Education has been created to mobilize current opinion as to how the problems in this field can best be solved and to formulate the educational principles involved in graduate medical training, according to a recent announcement The president of the board, Dr Willard C Rappleye, New York, appointed four members of the board to form the commission, which is comprised of representatives of the medical profession, hospitals, universities, medical schools and licensing bodies The personnel is as follows

Dr Fred L Adair Chicago vice president American Board of Obstetrics and Gynecology
Dr Arthur C Bachmeyer Chicago director University of Chicago Clinics
Dr Donald C Balfour director of the Mayo Foundation for Graduate Medical Education Rochester Minn
Dr Kenneth D Blackfan professor of pediatrics Harvard University Medical School Boston
Dr James D Bruce director of the department of postgraduate medicine University of Michigan Ann Arbor
Dr Robin C Buerki superintendent of the State of Wisconsin General Hospital Madison
Dr Anton J Carlson professor of physiology University of Chicago
Dr Walter F Donaldson Pittsburgh secretary Medical Society of the State of Pennsylvania
Dr Reginald Fitz Boston member of the Council on Medical Education and Hospitals American Medical Association
Dr Everts A Graham St Louis chairman American Board of Surgery
Dr Frank W Hartman Detroit secretary American Board of Pathology
Dr Willard C Rappleye dean Columbia University College of Physicians and Surgeons director New York Post Graduate Medical School New York
Dr John Stewart Rodman Philadelphia medical secretary National Board of Medical Examiners
Dr Harold L Rypins Albany N Y secretary New York State Board of Medical Examiners
Dr Alfred Stengel vice president in charge of medical affairs University of Pennsylvania Philadelphia
Dr William P Wherry Omaha secretary American Board of Otolaryngology
Dr Allen O Whipple New York vice chairman American Board of Surgery
Dr Ray Lyman Wilbur Stanford University California chairman of the Council on Medical Education and Hospitals American Medical Association
Dr John B Youmans director of postgraduate instruction Vanderbilt University School of Medicine Nashville Tenn

CANADA

Personal—Dr Roy B Jenkins, lecturer in public health at the University of Alberta and medical officer of health of the city of Edmonton, has resigned to become chief of the division of epidemiology in the federal department of pensions and national health Dr George M Little, Red Deer, Alta, has been appointed health officer of Edmonton

Testimonial to Dr Bruce—Dr Herbert A Bruce, who recently retired as lieutenant governor of Ontario after five years in the office, was the guest of honor at a banquet, December 14, at the Royal York Hotel, Toronto More than 1,000 persons from all parts of the province attended the dinner, at which Sir William Mulock, chief justice of the second division of the supreme court of Ontario, presided An illuminated address was presented to Dr Bruce for the province by Sir Thomas White, former federal minister of finance and a similar one for the city of Toronto by Mayor W D Robbins A bracelet was given to Mrs Bruce on behalf of the women of Ontario by Mrs Newton Wesley Rowell, wife of the chief justice of Ontario Dr Bruce was graduated from the University of Toronto Faculty of Medicine in 1892 and is now emeritus professor of surgery He served as president of the Ontario Medical Association in 1911-1912 and of the Academy of Medicine of Toronto in 1916-1917 He is a former regent of the American College of Surgeons and is a fellow of the American Surgical Association During the World War he served with the Canadian Army Medical Corps and in 1917 and 1918 was consulting surgeon to the British armies in France

Foreign Letters

LONDON

(From Our Regular Correspondent)

Dec 4, 1937

Cancer Research

At the annual meeting of the British Empire Cancer Campaign, Lord Horder, who submitted the report, said that schemes of research were being conducted over a wide area. He drew particular attention to the work of Dr. Alexander Haddow at the Royal Cancer Hospital, from which it appeared that the application of minute doses of certain cancer-producing chemicals would cause definite regression and in some cases disappearance of tumors present in animals. Such a phenomenon was not uncommon in medicine. When taken in small doses many substances acted as remedies, though in larger doses their effects were far from beneficial. The work in the northern part of England of Prof. W. E. Curtis and Dr. Frank Dickens was equally suggestive. Surgery, x-rays and radium still remained the principal methods available, in spite of unceasing search for new forms of treatment. Every line of research that gave promise of supplementing these standard treatments received full and careful consideration by the campaign. An important development was due to an inquiry now being carried on by Curtis and Dickens into the action of ultrashort wireless waves. They had demonstrated that the curative effects of these waves in the experimental treatment of cancer was brought about by the heat which they generated within the tissues. This heating was of a special character, for it could be controlled and localized with an accuracy previously impossible. The temperature could be raised within the tumor to any desired level and kept there as long as desired. Thus one of the older weapons used against cancer—the actual cautery—was now being revised, but in a form incomparably less drastic and more refined, and based on quite different principles, for it aimed at the mildest degree of warming over a prolonged period. By this method a high degree of success had been secured in the treatment of animal tumors. As with radium, it was found that careful control of dosage was necessary and that great differences existed in the susceptibility of different tissues to controlled heating.

Defense Against Poison Gas in Air Raids

In the House of Commons Mr. Geoffrey Lloyd, parliamentary undersecretary of the Home Office, described experiments carried out to test recommendations made by the government for protection of the civil population against poison gas in air raids. One experiment was to assess the degree of protection of a house that had not been treated in any way. Over a ton of chlorine gas was released 20 yards away, so that the wind carried it straight to an unprotected room. A fire was burning in the hearth and the only measure taken to exclude the gas consisted in closing the doors and windows. Persons who occupied the unprotected room found that the gas penetrated slowly and after about seven minutes it became necessary to put on respirators. The quantity of gas concentrated on the house could, under ordinary conditions, be obtained only from several large bombs dropped very close to it. In another experiment the house was enveloped in a cloud of mustard gas for an hour. Animals placed in an unprotected room did not suffer. In a third experiment the house was enveloped for twenty minutes in a dense cloud of arsenical smoke. Men in an unprotected room found that the smoke penetrated, but in a strength much less than that outside. When respirators were worn they afforded complete protection. A second series of experiments was performed with the added protection obtained from following the instructions (given in the Air Raid Precautions Handbook) of pasting slips of paper over all apertures.

Complete safety and protection were afforded except under the most severe conditions, when slight irritation was caused, and then the use of the respirator was efficient.

Contact Lenses

In the medical press three ophthalmologists (Andrew Rugg-Gunn, F. A. Williamson-Noble and Ida Mann) refer to the interest excited by the question of contact lenses since Dr. Josef Dallos of Budapest presented a paper on the subject at the Oxford Ophthalmological Congress. In theory correcting lenses worn in contact with the cornea offer the best method of correcting certain errors of refraction, but the practical difficulties have been regarded as insuperable. Various attempts have been made to overcome them and the most successful is that of Dallos. He makes a mold of the anterior segment of the eye and then the glass is accurately fitted to this. In the final fitting he removes pressure on the cornea and limbus region, where close contact cannot be borne, by grinding away the glass until a perfectly even and light pressure is attained. Such glasses can be worn for long periods without discomfort and are of great use in conical cornea, irregular corneal astigmatism, aphakia and high errors of refraction generally. They give a retinal image of normal size and greater visual acuity than that obtainable by spectacles, as well as a full field of vision. They are also indicated for occupational reasons, as in stage and film work, and in those exposed to rain and steam, where glasses would be likely to fog. A center has been opened in London, under the direction of a committee of ophthalmologists, for the supplying and fitting of contact lenses.

The Government and the Threatened Decline of Population

The approaching decline of population has at last led to official action. The minister of health, Sir Kingsley Wood, moved in the House of Commons the second reading of the population bill. He said that there was general agreement that the vital problem of population could not be left to look after itself. Anxiety was growing with regard to it in many nations of Europe. From 1871 to 1933 our birth rate had steadily declined and since 1871 it had more than halved. Since 1933 there had been a slight upward trend. If we could get further information it might show that forces existed having an upward tendency which might provide a basis for constructive policy. Much more information was required and in this matter we were behind Norway, Sweden, Holland, South Africa and many other countries, compared to which our population statistics were incomplete. The bill provided for answers to the following questions on registering a birth: ages of the father and mother, date of the marriage, and previous children and stepchildren. All this information would be confidential and would be used only for the compiling of statistics. There was a question about the issue of unmarried women, on which he would have regard to the judgment of the house. The result would be regular annual figures showing, area by area of the country, the number of children born to parents of particular ages and occupations with varying duration of marriage. These figures would be valuable in an inquiry into the causes of the declining birth rate. It had been said that this was due to the fear of war, that parents did not want to have children for "cannon fodder." This did not appear to be a substantial cause, for in the years immediately following the war, when the risk of another was appreciably lessened, there was a decline in the birth rate, while in the past four years, when many believed that there was a greater risk of war, the decline had been checked. Poverty did not seem to be the main cause, for wealth per head of population had steadily increased during the period of the decline. But all these were conjectures. Scientific research was needed.

The bill encountered much opposition on the ground that it was vexatious, intrusive into private matters and not of much

use for the purposes stated. In the debate Sir Francis Freemantle, a former health officer, who had been a member of various commissions which had considered the subject, made the important suggestion that there was some vital factor in modern civilization—not a voluntary factor but some involuntary, unconscious factor—that was undermining the fertility of the people generally in both sexes. When the subject was being discussed at the Society of Medical Officers of Health before the war and every one was saying that it was simply a question of contraceptives and birth control, the health officer of Glasgow read a paper to show that there was some further factor which might be associated with the greater pace at which we lived or the undue athleticism of girls. The only way in which the question could be settled was by statistical inquiry.

PARIS

(From Our Regular Correspondent)

Dec 4, 1937

Second International Transfusion Congress

At this year's International Transfusion Congress, held September 29-October 2 at Paris, the reports of four committees which had been appointed to study various problems were submitted. Their conclusions were as follows:

Committee on Blood Grouping. The von Dungern and Hirsfeld grouping is to be warmly recommended, but in practice the Beth Vincent grouping, when properly controlled, is acceptable. The ideal method is to find the group by simultaneous test of the red corpuscles and the serum. Agglutination tests on slides are the equivalent of other methods. Errors due to pseudo-agglutination are avoidable, especially by the use of a more dilute (one half) serum. Control is always to be recommended, either in the same laboratory or, better still, by comparison with other laboratories. In emergency cases, when no transfusion center is close at hand and universal donors are not available, the direct test of compatibility, i. e., serum of recipient and red cells of donor, must suffice. Such direct compatibility tests are to be especially recommended for transfusions in medical cases. The existence of universal donors whose blood when transfused may be followed by serious complications has not been confirmed. In cases in which a number of transfusions are necessary, it is advisable to repeat tests before each transfusion to ascertain whether the serum of the recipient neither agglutinizes nor hemolyzes the red corpuscles of the donor. Such a test should be carried out not only at laboratory but also at incubator (37° C) temperatures. An investigation of the biologic test, which consists of injecting a small quantity of the blood of the donor into the recipient, merits being carried further.

Serums that are used for grouping, kept under aseptic conditions, ought to have a high titer and their reaction ought to be tested at regular intervals toward the red corpuscles of the same individual to make sure of their activity.

Committee on Blood Conservation. In addition to existing fresh blood transfusion centers, the establishment of others is to be recommended where conserved blood is available for emergency use. It is preferable to take the blood of donors before breakfast. Only blood of group O (von Dungern and Hirsfeld grouping) ought to be conserved and a clinical inquiry should be made to avoid anaphylactic accidents on the part of the recipient. A minimum of manipulation is to be recommended in getting blood from a donor and the blood ought to be kept in refrigerators. The committee further recommended a study comparing fresh pure or stabilized blood, conserved blood, defibrinated blood and liquids that can be used as substitutes. The value of various anticoagulants ought to be investigated, also utilization of residual plasma and comparison of fresh and preserved blood for immunotransfusion.

Committee on Hematologic Problems. Certain patients with diseases characterized by blood changes present a sensibility

toward blood transfusion, hence every precaution must be taken as to the compatibility of donor and recipient. The value of transfusion in these cases is questionable because it is not without its risks. In Biermer's as well as in other forms of anemia, transfusion, although not a specific form of treatment, is indicated. The most striking results of transfusion are seen in the erythroblastoses of infants and in acute hemolytic syndromes like those of Lederer. Transfusion as a prophylactic measure should be employed in all persons subject to hemophilia before operative intervention. In grave hemogenic syndromes it is only palliative and its indications are those of hemorrhages in general. In the hemorrhagic syndromes of infectious diseases, transfusion acts as a hemostatic agent and as an aid to the defensive mechanisms of the body.

Committee on Organization. Although the use of the sodium citrate method was widespread during the World War, the question arises for the future whether fresh or conserved blood should be used. It seems likely that conserved blood will be far more frequently employed in future wars, the donors being noncombatants of both sexes. A transfusion service cannot be organized in haste but should exist in every large and small community with lists of available donors, trained technicians to make the groupings and medical assistants who are experts in giving transfusions. The section in the Palais de la Decouverte of the Paris exposition this summer showed various types of apparatus and, by means of wax models, the technique of blood transfusion.

Tuberculous Patients as Government Employees

According to a government order promulgated in 1929, every applicant for a position must be examined by a phthisiologist and be refused employment if any form of tuberculous infection is found, even if, for example, a pulmonary focus is apparently healed. A change in this rather rigid rule has just been proposed for the department of the Seine, in which Paris is situated, published in the November 24 issue of the *Presse medicale*. All former patients of public sanatoriums whose condition permits resumption of active work shall be given employment in these institutions. They must, however, be examined by the physician in charge of the sanatorium. The examination must include a general physical one, radiography of the chest and bacteriologic examination of the sputum. The results shall be kept on file and a control made by another physician appointed by the minister of public health every six weeks. In case reactivation of the tuberculous lesions are found, the employee is to be kept in the sanatorium until his condition permits resumption of work. All these patients are covered by the social insurance invalidity provisions during the periods of unemployment. The question whether such provision for apparently stationary cases of pulmonary tuberculosis merit further study is receiving attention as to its more extensive application in giving employment to these patients in state institutions.

Tuberculosis in Public School Teachers

Although efforts are constantly being made to combat infection of school children by means of skin reactions as aids in detecting the presence of tuberculosis, the same amount of energy is not being displayed toward avoiding contamination by tuberculous teachers and the personnel of creches and pre-ventoriums. A paper was read by Etienne Bernard and P. Lafosse on this subject at the June 12 meeting of the Paris Tuberculosis Society. A case was cited of a school teacher who had been refused as a recruit by the military authorities because of a pulmonary tuberculosis. Three months later he resumed his activities as a teacher. The incidence of positive skin reactions among his pupils rose to 90 per cent as compared to an average of 30 per cent for children of the same age and environment. A little later, one of the children died of tuberculous meningitis.

A stricter surveillance was urged not only of school teachers but also of the personnel of any institution in which infants and young children are taken care of for prolonged periods. A thorough examination of all such children should include pulmonary radiography at intervals of six months as well as skin reactions, at even more frequent intervals, of all children in schools or institutions where many children are placed in a single room or ward.

The 1937 French Surgical Congress

In previous letters, the three reports read at this year's French Surgical Congress were abstracted. In addition to these reports on burns, arterial embolism and fractures of the leg, papers on miscellaneous surgical subjects were presented.

Paschoud of Lausanne, who is using infra-red rays during operations, stated that measures of skin temperatures by special apparatus show much less radiation when infra-red rays are used. Descarpentries of Roubaix found that infra-red and ultra-violet rays during suprapubic prostatectomy greatly decrease the operative risk and postoperative pain.

The 1938 surgical congress will have, as subjects for specially prepared reviews of the literature in the form of reports, staphylococcal septicemias amenable to surgical intervention, and treatment of fractures of the spine and malignant neoplasms of mesoblastic origin of the extremities.

BERLIN

(From Our Regular Correspondent)

Nov 15, 1937

The Incidence of Hereditary Diseases

Professor von Verschuer of Frankfurt University addressed the International Congress for Folk Study at Paris on the incidence of hereditary disease. He quoted statistics based on the genetic studies that have been in progress in Germany. It has been estimated that about 80 per cent of feeble-mindedness is conditioned by heredity, 20 per cent by environment. The proportion of congenital feeble-mindedness is greater among cases of less serious mental debility. Any determination of the frequency of feeble-mindedness is dependent on a definition of the limits of normality. In Germany from 40,000 to 50,000 weak-minded persons are confined in institutions, among the debilitated population of the reich in 1925, about 100,000 persons were classed as feeble-minded. Every official census and most of the unofficial censuses provide inexact minimal figures which represent only the most severe and a portion of the moderately severe cases. More reliable data are to be elicited by the survey of the homogeneous resident population of a restricted area, an examination of 37,000 inhabitants of Thuringia disclosed an average of 59 feeble-minded persons per thousand of population. If this proportion is considered valid for the entire German reich, the number of feeble-minded would be about 400,000, among the infirm population the proportion would be four times greater. Yet the foregoing estimate fails to include the large number of persons of dull mentality. To the latter group belong the vast majority of the pupil population of the special schools for backward children, namely, those pupils who cannot keep up with the common school curriculum. From 2 to 3 per cent of all school children are assigned to the special schools. This means that, of a national population of 67,000,000, from 1,500,000 to 2,000,000 persons remain at the intelligence level of special school pupils. That the estimated proportion of from 1.5 to 2 per cent feeble-minded persons in the general population is rather too low than too high is attested by the results of a recent well planned medical survey of various regional groups. Some examples of the data elicited are herewith given. In the Bavarian Alps, among about 5,400 persons 55 per cent were found to be oligophrenic and 2.2 per cent imbeciles and idiots. These high figures are to be explained by the endemic cretinism of the region. Among 3,000 persons

belonging to the agricultural population of central Germany, 35 per cent were found to be feeble-minded, 0.5 per cent of these imbecile. Lenz believes that the true distribution of the main categories of the feeble-minded in a given population is something like 0.25 per cent idiots, 0.5 per cent imbeciles and from 2 to 3 per cent weak-minded (morons). Although these studies have enriched our knowledge of the absolute incidence of feeble-mindedness, we do not yet know whether the frequency of congenital mental deficiency varies according to particular geographic regions. It is extremely difficult to gauge the incidence of schizophrenia, as only those persons who receive medical treatment can be brought within the scope of an investigation and, moreover, the differential diagnosis of borderline cases offers a formidable problem. On the basis of the most precise investigation possible, the incidence of probable schizophrenia may be reckoned at from 8 to 9 per thousand of population. Professor von Verschuer, with especial consideration of the age groups in which morbidity is greater, places the number of schizophrenic persons in Germany at about 280,000, there would seem to be some variations based on geography.

For blindness, too, the statistics are still rather unreliable. The national census of 1925 estimated the number of blind persons at 33,000, namely, 5.3 per 10,000 of population. Only by a painstaking classification of etiologic factors, based on comparative studies of both clinical and familial data, will the physician be able to differentiate between hereditary and non-hereditary blindness. Among 407 cases at Frankfurt-on-the-Main, ninety-two (23 per cent) could be proved of hereditary origin. If the cases of war-blinded soldiers were deducted from the total, the proportion of hereditary blindness cases was 25 per cent. Not infrequently cases of blindness based on heredity are observed (above all in recessive hereditary transmission), these seem to be unique within a family, namely, no other members of the immediate family are so afflicted. This means that the true proportion of hereditary blindness among all cases of blindness is greater than one fourth and nearer one third. Similar conclusions have been reached in other countries, the Netherlands, for example. The incidence of congenital dislocation of the hip can be quite generally ascertained, thanks to the good organization of care for crippled in Germany. The proportion in Bavaria, for example, is from eight to ten per 10,000 of population. This figure is not valid for the reich as a whole, however, since regional differences in the frequency of the defect are considerable. Thus in many sections of Bavaria the rate is only from 3 to 4 cases per 10,000, whereas in other sections it is from 13 to 14 per 10,000 (ranging from 8 to 30). All of the foregoing are minimal figures.

Several of Verschuer's general conclusions are interesting. The author takes exception to the prevalent opinion of race as a factor in hereditary predispositions. It is generally believed, for example, that amaurotic idiocy is peculiar to the Eastern Jews, sickle cell anemia to the Negroes, and Oguchi's disease to the Japanese. Yet cases of these disorders have been observed in members of other racial stocks. Furthermore, most pathologic hereditary predispositions as recognized in Europeans have also been observed in Japanese. Only rarely is it possible to observe mutations anywhere in the human race and then only in a few small branches and without any demonstrable connection with race. An interrelation of pathologic hereditary predispositions and race can be assumed only if pathologic mutations appear more frequently in one race than in others. The hemophilic diathesis, for example, is more commonly observed among western Europeans, above all in Württemberg and Switzerland as well as in England and among Jews. Elsewhere it is a rare affliction. Few cases have been reported from Japan, and the literature is said to contain no record of a hemophilic Negro. Cases of the disease in North America and in South Africa have all been traceable to central European immigration. Variations in incidence of this sort permit us to assume a differing proneness to mutation in particular races.

and it also may be that certain exogenous mutational factors are present in certain regions, absent in others

One question of more than ordinary interest for racial pathology is this. To what extent is the phenotypical picture of certain pathologic diatheses influenced by the race of the transmitter of heredity? There are extant abundant human data bearing on this problem, and these permit us to assume some degree of interrelation. But firmly established genetic proofs are still lacking. Genetic surveys of geographically circumscribed populations are necessary if this problem is to be further elucidated. Many such surveys are at present taking place.

This approach will also help to determine the incidence and geographic distribution of the rarer pathologic hereditary predispositions.

Feeble-mindedness and Parental Drunkenness

Bonn University's Institute of Hygiene in collaboration with the municipal health department has investigated the relationship of alcoholism to feeble-mindedness and defective heredity. Dr. Lechner found that of 254 pupils in the special schools for backward children 205 (80.7 per cent) were congenitally tainted. The accompanying table lists the familial defects established and the percental distribution of these among the 205 children studied.

Lechner's observations show that in addition to a computation and evaluation of the incidence of defective heredity as a whole one should also attempt a more intensive, social-medical

Defective Familial Background

	Percentage
Both parents of extremely low intelligence	4.1
Father alone feeble-minded	5.9
Mother alone feeble-minded	17.2
Parents of subnormal intelligence	21.3
Feeble-mindedness in ascendancy but not in parents	3.0
Feeble-minded siblings	6.5
Epilepsy	8.3
Other mental defects of parents	1.8
Alcoholism of parents and grandparents	29.0
Syphilis	2.3

study of particular heritable defects. Lechner divides hereditary taints into two categories on the basis of the foregoing data. 1. Two thirds of the children examined are victims of the will to procreate on the part of mentally or neurologically subnormal parents. 2. Furthermore, in the ascendancy of from one fourth to one third of the children at least one parent or grandparent was established who, on account of addiction to alcohol, must have been morally or physically unfit to have issue.

These observations clearly show that the hereditary taint of feeble-mindedness cannot be eradicated solely by sterilization of mentally subnormal persons. Misuse of alcohol plays an important part with regard to the mentality of the offspring, all the more so since students of medicosocial problems the world over have found that persons who overindulge in alcohol are the very ones who, provided they are sexually active, tend to propagate far more rapidly than temperate persons and even more rapidly than the feeble-minded. The foregoing statement applies above all to those habitual heavy drinkers who exhibit no signs of "alcoholism" in the forensic sense of the term. Thus is posed an important problem, one which is not to be solved by eugenic legislation alone, since entirely new cases of alcoholism will continue to originate.

The Social Cost of the Feeble-minded Family

Two studies of the cost to society of the feeble-minded family have recently been published. The first study was made by the welfare bureau of a city in western Germany. It traces the cost to society since the year 1880 of a certain defective family. Eighty members of this family received a total of 201 sentences for various offenses, nineteen children were committed to special industrial schools, ten members of the family

were prostitutes. This family had cost the community a total of 205,000 reichsmarks, a sum that corresponds roughly to the amount of taxes paid by 10,000 workers or to the expense of erecting sixty-eight workers' colony homes. The second investigation took place at Stuttgart. A man-servant begot seven feeble-minded children in wedlock. After his death the feeble-minded widow had an illegitimate child likewise feeble-minded. All eight of these children, completely neglected, had to be placed in institutions for the feeble-minded. In ten years the state has expended 37,087 reichsmarks for their care. If each child's further expectation of life is estimated at thirty years, the future cost to society will be 100,000 reichsmarks.

SWITZERLAND

(From Our Regular Correspondent)

Nov 18, 1937

Fluctuations in Diseases During the Last Forty Years

Prof. Rudolf Staehelin, ordinarius in internal medicine and director of the medical clinic of Basel University, recently discussed fluctuations in the incidence and type of various diseases during the last forty years. His statistics were based on the clinical records of his own institution. The complete text of his report has appeared in the *Schweizerische medizinische Wochenschrift*. His principal observations follow. The population has aged, there is at present more disease of old age such as cancer and cardiovascular disorders, especially degenerative disease of the myocardium. Of the contagious diseases, scarlet fever suddenly assumed a milder course around 1889. Prior to that year the mortality was as high as eighty-one annually, now there are but one or two fatal cases. Measles, too, has become milder, although the mortality was still fairly high in 1904. At Basel, diphtheria has been a relatively mild infection, the city has escaped severe epidemics such as have occurred elsewhere. Lethargic encephalitis appeared in 1917 as a new entity, the first case was reported prior to the great influenza pandemic. Since 1925 no more cases had been observed till a single case was admitted just a few weeks ago. Typhoid has greatly receded since 1898. The number of paratyphoid cases has remained about the same (from three to four per annum). Brucellosis has been on the increase at Basel, as everywhere else in Europe, the first cases were admitted in 1933. Pathologic abortion in cattle has, however, been recognized in Switzerland for a much longer time. A similar disorder found in swine is likewise communicable to man. As has been observed elsewhere, tuberculosis has undertaken a marked recession since 1882. To be sure, this is true only of pulmonary tuberculosis, miliary tuberculosis and tuberculous pleurisy have remained the same. Tuberculous meningitis showed an increase at first and then declined, on the whole it tends to remain stationary. Cases of all the metastatic tuberculosis have remained constant.

The proportion of cases of cardiac failure has remained the same. Endocarditis has not increased but cardiac myodegeneration, as already mentioned, has taken a sharp upturn. Despite improved diagnostic methods, diagnoses of aneurysm have not been any more frequent (owing to the decline of syphilis). Angina pectoris has not greatly increased, like coronary sclerosis it appears more frequently in the records merely because of more accurate diagnoses, based on the electrocardiogram. Emphysema has declined, the author explains this by the fact that emphysema is a disease of persons engaged in heavy manual labor and has become more infrequent as hard labor has been superseded by the machine. Lobar pneumonia has declined slightly but its lethality is unchanged. Its general character was the same in 1936 as in 1901. Tumors of the lungs, especially bronchial carcinoma, have certainly increased not only because of more accurate diagnosis but on the basis of necropsy reports as well. Cases of the acute type of articular rheumatism have declined. This disease has under-

gone a change in character. Cases of severe chronic articular rheumatism have declined slightly. Cases of spondylarthritis deformans have slightly increased. Tabes has not appreciably declined but its character is altered. Today the disease is much more frequently observed in a rudimentary form, whereas the classic type has become a rarity. Staehelin himself for several years now has found it impossible to demonstrate a typical case of tabes for his students. Multiple sclerosis has on the contrary increased, quite likely as a consequence of more accurate diagnoses since 1910, the year in which Quincke's puncture was introduced. Two cases of the disorder known in France as "meningitis of young swineherds" were recorded, this disorder seems to be a new entity akin to brucellosis. It was first observed in dairy regions and is presented only by persons who have recently tended swine. In some cases it takes the form of severe serous meningitis, but complete recovery is the rule.

Cases of ulcer ventriculi have remained constant. Increasingly more frequent diagnoses have been made of duodenal ulcer, cholelithiasis, pancreatitis, duodenitis, intestinal giardiasis and endemic sprue. Carcinoma of the stomach has remained unchanged. Severe cases of chlorosis are no longer seen, but there is rather more chloroprivic anemia. In the course of the decades studied, cases of pernicious anemia show first an increase, then a decrease. Formerly more patients were hospitalized, but since the favorable influence of liver therapy has made itself felt many more patients now remain ambulant. Funicular myelosis has become a more frequent complication in pernicious anemia, Staehelin interprets this phenomenon in terms of a spontaneous alteration in the character of the disease. Agranulocytosis and panmyelophthisis have become more frequent, the former from the use of aminopyrine, the latter from the use of arsphenamine. Predisposition is an additional factor in both disorders. Hyperthyreosis and exophthalmic goiter have greatly increased, probably because milder cases have become easier to recognize by analyses of the basal metabolism. Alcoholism in its various aspects declined during and immediately after the war but is at present once more on the increase.

Of 1,947 cases of intoxication (other than alcoholic), strangely enough only 115 terminated fatally. Industrial poisonings compose a comparatively small proportion and despite the expansion of industry they have shown a relatively slight increase. Plumbism, too, has declined but is still seen. The victims are now more likely to be workers in the enameling industries than painters and compositors, as formerly. Since 1920 there has been a marked increase in the number of intoxications from carbon monoxide and from hypnotic drugs. The carbon monoxide cases in great measure and the hypnotic drug cases almost without exception have originated in attempted suicide. According to the data the lethality of suicidal attempts in which these agents are employed is not great, in fact, the lethality of carbon monoxide poisoning is quite slight. Of 366 patients poisoned by illuminating gas and carbon monoxide, only eighteen (5 per cent) succumbed, of 158 patients poisoned by overdoses of hypnotics, sixteen (10 per cent) died.

If the foregoing observations are studied in toto, it will be noted that the more striking changes in pathologic character have been among several of the contagious diseases. In many of the noninfectious diseases, on the other hand, changes have taken place in the diagnoses rather than in the nature of the disorders, these represent no mere fluctuation in diagnostic fashion but a truly improved understanding, which is often a boon to the patient. Staehelin believes he has determined a spontaneous alteration in the pathologic character of chlorosis as well as in funicular myelosis, if the latter appears as a sequel of pernicious anemia. It was not considered necessary to make particular mention of certain diseases that are generally known to have been more or less robbed of their malignancy by more advanced therapeutic methods, e.g., diabetes, pernicious anemia and numerous endocrine disorders.

International Congress of Physiologists at Zurich

The sixteenth International Congress of Physiologists will meet in Zurich Aug 14-18, 1938. Prof W R Hess of Zurich is president, Prof Ernst Rothlin of Basel, general secretary. The 1938 assembly will coincide with the fifty year jubilee of these international congresses. On the agenda of the scientific proceedings are experimental demonstrations, including displays of newer apparatus and methods, cinematographic demonstrations, discussions of timely problems and finally the reading of individual papers. Each of the principal themes of general discussion will be introduced by authoritative summaries of the background and present state of the particular problems (these summaries together with the entire program of the congress have already been completed).

The six sections of the congress will represent general and comparative physiology, biophysics, biochemistry, applied physiology (the physiology of occupations, sports, aviation), psychophysiology and pharmacology. Americans who wish further information should address the American Societies for Experimental Biology, Federation Secretary (Prof D R Hooker), 19 West Chase Street, Baltimore, Md.

The International Congress of Cytologic Research Workers (president, Professor von Moellendorff of the Anatomic Institute, Zurich) will be held August 7-13, namely, immediately preceding the physiologists' meeting. Following the latter the International Congress of Veterinarians (president, Professor Fluckiger, director of the Swiss Veterinary Bureau, Berne) will be held August 21-25.

Professor Karrer Nobel Prize Winner

The Nobel prize for chemistry has been divided between Prof Dr Paul Karrer of Zurich and Prof W N Haworth of Birmingham, England. Professor Karrer, a native Swiss, is 48 years old. He served a year as assistant to Professor Werner at Zurich and then for six years was associated with Paul Ehrlich. In the spring of 1918 he was called to Zurich University as special professor and in the following year he was appointed ordinarius in the entire field of chemistry. In 1923 Karrer received the Marcel Benoist prize, a Swiss award, for his research on carbohydrates. In recent years Karrer's investigations of vegetable coloring matter and the vitamins have gained him an international reputation. The Nobel prize was awarded him in recognition of his research on the carotenoids, the flavins and vitamins A and G. A few years ago he also received the degree of doctor honoris causa from the medical faculty of Breslau University.

Professor Haworth received the prize in recognition of his research on carbohydrate and vitamin C.

Marriages

REYNOLDSON DUKE BUTTERWORTH, Richmond, Va., to Miss Mary Knewstep Richardson of Dinwiddie County, Oct 23, 1937.

PAUL HOUSTON REVERCOMB to Miss Elizabeth Kemper Young, both of Charleston, W Va., Nov 6, 1937.

GEORGE D VERNILYA, Richmond, Va., to Miss Martha Anne Carpenter of Monroe, N Y., Nov 13, 1937.

SANNIE G MILLER of Piney River, Va., to Miss Josephine Louise Saunders of Roseland, Oct 23, 1937.

EDWIN BRYANT MURCHISON, Tyrone, Pa., to Miss Kathryn Dolores Hanlon of Altoona, Nov 25, 1937.

CHARLES S KRAUSE to Miss Sadie Combs, both of Cedar Rapids, Iowa, in Sigourney, Nov 15, 1937.

PHILIP LEWIS LYLE to Miss Patsy Geraldine Rudolph, both of Clarksville, Tenn., Nov 20, 1937.

RICHARD CLARK BENKENDORF, Bushnell, Ill., to Miss Celeste O'Brien of Chicago, Nov 27, 1937.

EMANUEL U WALLERSTEIN to Miss Anne Ruffin Sims, both of Richmond, Va., Nov 11, 1937.

Deaths

Lawrason Brown ♂ for many years chairman of the medical board of the Trudeau Sanatorium, Trudeau, N. Y., died Dec 26, 1937, at his home in Saranac Lake. Dr. Brown was born in Baltimore Sept 29, 1871. He took the baccalaureate degree at Johns Hopkins University in 1895 and graduated from the school of medicine in 1900. That year he joined the staff of the Trudeau Sanatorium as assistant resident physician and the following year became resident physician. In 1912 he was appointed visiting physician and later became consulting physician. He was an instructor in the Trudeau School of Tuberculosis, a training school for physicians established under the Edward L. Trudeau Foundation, from its establishment in 1916. Since 1926 he had also been consultant to the Waverly Hills Sanatorium, near Louisville, Ky. Dr. Brown was a member of the board of trustees of the Trudeau Sanatorium, the New York State Hospital at Ray Brook, Potts Memorial Hospital, Livingston, N. Y., and of the advisory council of the Henry Phipps Institute of the University of Pennsylvania, Philadelphia. He was president of the American Clinical and Climatological Association in 1920, the American Sanatorium Association from 1919 to 1923 and the National Tuberculosis Association in 1922. He was a fellow of the American College of Physicians and a member of the Association of American Physicians, the American Association of Thoracic Surgery, the American Association for the Advancement of Science and the American Public Health Association. The National Tuberculosis Association awarded him the Trudeau Medal in 1933 in recognition of his achievements in the study of tuberculosis. From Dartmouth College in 1931 and from the Medical College of Virginia in 1936 he received the honorary degree of doctor of science. Dr. Brown was the author of "Rules for Recovery from Tuberculosis," "Intestinal Tuberculosis" (with Homer L. Sampson) and "The Lung and Tuberculosis" (with Dr. Fred H. Heise). He was a contributor to Osler and Macrae's "Modern Medicine," Tice's "Practice of Medicine," Kleb's "Tuberculosis," Cecil's "Textbook of Medicine" and Blumer's "Therapeutics of Internal Diseases" and was a frequent contributor to periodical literature.

Richard Hermann Jaffé, Chicago, Medizinische Fakultät der Universität Wien, Austria, 1913, professor of pathology at Rush Medical College and the University of Illinois College of Medicine, member of the American Association of Pathologists and Bacteriologists and the American Society for Experimental Pathology, since 1922 director of laboratories at the Grant Hospital, head of the department of pathology and since 1928 director of laboratories at the Cook County Hospital, aged 49, died, Dec 17, 1937, of coronary thrombosis.

Leora G. Bowers ♂ Dayton, Ohio, Louisville (Ky.) Medical College, 1898, member of the House of Delegates of the American Medical Association in 1926, past president of the Ohio State Medical Association, member of the Western Surgical Association, fellow of the American College of Surgeons, on the staff of the Miami Valley Hospital, aged 66, died, Oct 16, 1937, in Longview, Wash.

Albert Warren Ferris, East Orange, N. J., College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1882, member of the Medical Society of the State of New York, past president of the New York State Lunacy Commission, fellow of the American College of Physicians, aged 80, died, Oct. 4, 1937, of coronary occlusion and encephalitis.

Eugene A. Moulton, Chicago, Hahnemann Medical College and Hospital, Chicago, 1906, member of the Illinois State Medical Society, served during the World War, formerly associate professor of materia medica at his alma mater, on the staffs of the Belmont and the Illinois Masonic hospitals, aged 60, died, Oct 13, 1937, of chronic myocarditis.

John Scott Springer ♂ Boise, Idaho, University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1906, past president of the Idaho State Medical Association, fellow of the American College of Surgeons, on the staff of St. Luke's Hospital, aged 59, died, Sept 29, 1937, in St. Luke's Hospital, of coronary artery occlusion.

Richard H. Street ♂ Chicago, Hahnemann Medical College and Hospital, Chicago, 1898, formerly professor of otolaryngology at his alma mater, fellow of the American College of Surgeons, on the staffs of the Chicago Memorial and Illinois Masonic hospitals, aged 63, died, Oct 23, 1937, of coronary sclerosis and arteriosclerosis.

Frederick Daniel Raker, Shamokin, Pa., Jefferson Medical College of Philadelphia, 1881, member of the Medical Society of the State of Pennsylvania, formerly county coroner, aged 81, died, Oct 6, 1937, in the George F. Geisinger Memorial Hospital, Danville, of benign prostatic hypertrophy and chronic myocarditis.

Percy Wingate Olive, Fayetteville, N. C., College of Physicians and Surgeons, Baltimore, 1907, member of the Medical Society of the State of North Carolina, past president of the Cumberland County Medical Society, aged 58, died, Oct 12, 1937, in the Pittman Hospital, of acute dilatation of the heart.

Ronda Horton Hardin ♂ Banners Elk, N. C., North Carolina Medical College, Charlotte, 1914, fellow of the American College of Physicians, member of the county board of education, on the staff of the Grace Hospital, aged 44, died, Oct 9, 1937, of coronary thrombosis and ruptured gastric ulcer.

Clarence Baker Agnew Turner, Dyersburg, Tenn., Vanderbilt University School of Medicine, Nashville, 1906, past president of the Obion County Medical Society, served during the World War, formerly health officer of Obion County, aged 56, died, Oct 2, 1937, of cardiovascular renal disease.

Ralph St. John Perry ♂ Minneapolis, Medical College of Indiana, Indianapolis, 1884, at one time a missionary in West Africa, served during the World War, formerly associated with the U. S. Veterans Bureau, aged 73, died, Oct 4, 1937, in Fort Snelling, of hypertension and cerebroclerosis.

Charles A. Tindall, Shelbyville, Ind., Eclectic Medical Institute, Cincinnati, 1887, member of the Indiana State Medical Association, past president of the Shelby County Medical Society, on the staff of the W. S. Major Hospital, aged 70, died, Oct 9, 1937, of cardiovascular renal disease.

Ardus Clair Thompson, Franklin, Pa., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1909, past president of the Venango County Medical Society, served during the World War, formerly on the staff of the Franklin Hospital, aged 52, died, Oct. 9, 1937.

Frank Joseph Noonan ♂ Philadelphia, University of Pennsylvania School of Medicine, Philadelphia, 1926, clinical assistant in laryngology and rhinology, Temple University School of Medicine, on the courtesy staff of the Misericordia Hospital, aged 35, died suddenly, Oct 1, 1937.

John Victor Hunter, Asheboro, N. C., University of Louisville (Ky.) Medical Department, 1898, on the staff of the Randolph Hospital, past president of the Randolph County Medical Society, aged 66, died, Oct 7, 1937, of myocarditis, arteriosclerosis and cerebral hemorrhage.

Calvin A. Frazee, Springfield, Ill., Chicago Homeopathic Medical College, 1887, member of the Illinois State Medical Society, past president of the Sangamon County Medical Society, aged 74, died, Oct 4, 1937, of acute dilatation of the heart, arteriosclerosis and hypertension.

Harry Clayton Loveless ♂ Griggsville, Ill., St. Louis College of Physicians and Surgeons, 1904, past president of the Pike County Medical Society, served during the World War, aged 60, died, Oct 7, 1937, in Jacksonville, of arteriosclerosis and cerebral hemorrhage.

Ira Cheleous Ballard, Gadsden, Ala., Chattanooga (Tenn.) Medical College, 1900, member of the Medical Association of the State of Alabama, past president and secretary of the Etowah County Medical Society, aged 68, died suddenly, Oct 4, 1937, of angina pectoris.

Claudius W. Stewart, Osyka, Miss., Baylor University College of Medicine, Dallas, 1905, member of the Mississippi State Medical Association, county health officer, aged 59, died, Oct 13, 1937, in a hospital at McComb of injuries received in an automobile accident.

Harvey Allen Murray, Wilmington, Del., Howard University College of Medicine, Washington, D. C., 1913, member of the board of education and of the board of health, aged 46, died suddenly, Oct 21, 1937, in the Homeopathic Hospital, of cerebral hemorrhage.

Paul Mason Thompson ♂ Bay Minette, Ala., Temple University School of Medicine, Philadelphia, 1932, county health officer, secretary-treasurer of the Baldwin County Medical Society, aged 32, died, Oct 9, 1937, of chronic myelogenous leukemia.

Gregor Christopher McLeod, Lyons, Texas, University of Tennessee Medical Department, Nashville, 1891, member of the State Medical Association of Texas, aged 80, died, Oct. 6, 1937, of fracture of the hip and arteriosclerotic heart disease.

Leopold Abraham Koppel * Jersey City, N J , University and Bellevue Hospital Medical College, New York, 1908, served during the World War, on the staff of the Greenville Hospital, aged 52, died suddenly, Oct 13, 1937, of heart disease

George Peter Barth * Milwaukee, University of Pennsylvania Department of Medicine, Philadelphia, 1898, medical director of the bureau of school hygiene, city health department, aged 64, died, Oct 23, 1937, of coronary thrombosis

Sylvan Daniels Lazarus * Brooklyn, Fordham University School of Medicine, New York, 1915, on the staffs of the Bushwick, Kingston Avenue and Jewish hospitals, aged 45, died, Oct 21, 1937, of hypertension, uremia and nephrolithiasis

William C McCutcheon * Cassopolis, Mich , Queen's University Faculty of Medicine, Kingston, Ont , Canada, 1894, physician in charge and part owner of the McCutcheon Hospital, aged 67, died, Oct 1, 1937, of angina pectoris

Patrick Henry Mee, Osseo, Minn , University of Minnesota College of Medicine and Surgery, Minneapolis, 1903, member of the Minnesota State Medical Association, aged 63, died, Oct 2, 1937, of coronary sclerosis and myocarditis

William Talmage James, Harrisburg, Pa , Medico-Chirurgical College of Philadelphia, 1890, member of the Medical Society of the State of Pennsylvania, aged 70, died, Oct 2, 1937, of chronic nephritis and myocarditis

Albert Edward Awde, Cape Elizabeth, Maine, University of Toronto Faculty of Medicine, Toronto, Ont , Canada, 1892, Victoria University Medical Department, Coburg, 1891, aged 68, died, Oct 13, 1937, of cerebral hemorrhage

Raymond Thomas Holden * Washington, D C , Georgetown University School of Medicine, Washington, 1881, for many years on the staff of the Providence Hospital, aged 77, died, Oct 16, 1937, of coronary thrombosis

Elizabeth Armitage Bruyn Hupp, Englewood, N J , Cornell University Medical College, New York, 1910, member of the West Virginia State Medical Association, aged 59, died, Oct 11, 1937, of cerebral hemorrhage

Harvey Lewis Grover, Brooklyn, University of the City of New York Medical Department, 1886, aged 73, died, Oct 10, 1937, in the Long Island College Hospital, of coronary and cerebral thrombosis and arteriosclerosis

Cecil James Johnston, Canton, Ill , College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910, served during the World War, formerly city physician, aged 53, died, Oct 6, 1937

Charles N Howard Jr, Cusseta, Ga , University of Georgia Medical Department, Augusta, 1888, formerly member of the state legislature and state senator, aged 68, died, Oct 12, 1937, of cerebral hemorrhage

Wilbur H Patton, Orleans, Ind , Louisville (Ky) Medical College, 1896, member of the Indiana State Medical Association, aged 68, died, Oct 9, 1937, at Rochester, Minn , following an operation for gallstones

Arthur Anthony Nack, Fort Defiance, Ariz , University of Michigan Medical School, Ann Arbor, 1930 special physician at large, office of Indian affairs, aged 34, died, Oct 7, 1937, of a self-inflicted bullet wound

Alexander M Steen, Palatka, Fla , University of Pennsylvania Department of Medicine, Philadelphia, 1882, chairman of the board of county commissioners and mayor, aged 76, died, Oct 8, 1937, of cerebral embolism

Francis Marion Griffin, Lynchburg, S C , Medical College of the State of South Carolina, Charleston, 1912, aged 51, died, Oct 2, 1937, in the McLeod Infirmary, Florence, of diabetes mellitus and gangrene

Henry Cortlandt Johnston, Cooperstown, N Y , College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1890, aged 71, died, Oct 2, 1937, of arteriosclerotic heart disease

James Milton Smith Jr, Cochran, Ga , University of Georgia School of Medicine, Augusta, 1933, member of the Medical Association of Georgia, aged 28, died, Oct 1, 1937, of pulmonary tuberculosis

Elgin Angus Gray, Toronto, Ont , Canada, University of Toronto Faculty of Medicine, Toronto, 1903, assistant superintendent of the Toronto General Hospital, aged 58, died, Oct 22, 1937, in Sarina

James Gardiner Littlefield * South Paris, Maine, Medical School of Maine, Portland, 1897, past president of the Oxford County Medical Society, aged 64, was strangled, Oct 13, 1937, by a patient

George Gagnard, Culdesac, Idaho, Harvey Medical College, Chicago, 1901, member of the Idaho State Medical Association, aged 69, died, Sept 27, 1937, at Lewiston, of carcinoma of the stomach

Thomas Cook Gifford * Utica, N Y , Syracuse University College of Medicine, 1902, on the staff of the Faxton Hospital, aged 64, died, Oct 12, 1937, of chronic myocarditis and arteriosclerosis

Jesse A Howell, Toledo, Ohio, Western Reserve University Medical Department, Cleveland, 1882, formerly county coroner, aged 82, died, Oct 13, 1937, in the Robinwood Hospital, of uremia

Leslie Washington Weedon, Tampa, Fla , University of the City of New York Medical Department, 1885, aged 77, died, Nov 12, 1937, in St Joseph's Hospital, of dilatation of the heart

Frank A Garis, Philadelphia, Hahnemann Medical College and Hospital of Philadelphia, 1889, on the staff of the Women's Homeopathic Hospital, aged 70, died, Oct 15, 1937, of endocarditis

Oscar A Bandel, Parsons, Kan , St Louis University School of Medicine, 1906, on the staff of the State Hospital for Epileptics, aged 56, died, Oct 12, 1937, of diabetes mellitus

Harry E Fineman, Philadelphia, Maryland Medical College, Baltimore, 1911, on the staff of the Northern Liberties Hospital, aged 61, died, Oct 7, 1937, of coronary thrombosis

Harry W Tull, Carrollton, Mo , Missouri Medical College, St Louis, 1891, member of the Missouri State Medical Association, aged 69, died, Oct 1, 1937, of cerebral hemorrhage

Joseph Wood Shaw * Coshocton, Ohio, Starling-Ohio Medical College, Columbus, 1908, aged 58, died, Oct 4, 1937, of an accidental gunshot wound received while hunting

Charles Ottis Wilkins, Hamill, S D , Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1906, aged 65, died, Oct 19, 1937, in Winner, of pneumonia

John Thomas Kufita, Boonton, N J , Loyola University School of Medicine, Chicago, 1933, aged 30, died, Oct 8, 1937, in the All Souls Hospital, Morristown, of pneumonia

Leonard Lincoln Landis, Brooklyn, University of the City of New York Medical Department, 1892, aged 67, died, Oct 9, 1937, of lobar pneumonia and chronic myocarditis

Fred Clifton Honnold, Glencoe, Ill , Rush Medical College, Chicago, 1896, aged 65, died, Oct 14, 1937, in the Highland Park (Ill) Hospital, of cerebral hemorrhage

Charles Henry Ewing, Philadelphia, Maryland Medical College, Baltimore, 1907, also a minister, aged 57, died, Oct 14, 1937, of pulmonary tuberculosis

Harold James McGuine, Hammond, Ind , University of Louisville (Ky) School of Medicine, 1931, aged 32, was killed, Oct 8, 1937, in an automobile accident

William Henry Dower, Halcyon, Calif , Syracuse University College of Medicine, 1891, aged 71, died, Oct 9, 1937, of chronic myocarditis and nephritis

Malcolm Pfannebecker, Chicago, Loyola University School of Medicine, Chicago, 1926, aged 39, died, Oct 7, 1937, in the Mercy Hospital, of leukemia

William E Rowley, St John, N B , Canada, McGill University Faculty of Medicine, Montreal, Que , 1900, died, in October 1937, of heart disease

James Elvis Luter, Clarksdale, Miss , Vanderbilt University School of Medicine, Nashville, Tenn , 1893, aged 71, died, Oct 6, 1937, of heart disease

Samuel Clarence McCorkle, Pittsburgh, Western Pennsylvania Medical College, Pittsburgh, 1903, aged 64, died, Oct 4, 1937, of myocarditis

Evan Worthington Michener, Philadelphia, Jefferson Medical College of Philadelphia, 1889, aged 65, died, Oct 11, 1937, of bronchopneumonia

Samuel Goldfarb * Buffalo, University of Buffalo School of Medicine, 1926, aged 39, died, Oct 10, 1937, of cholecystitis and acute hepatitis

James Francis DuVally, Malden Mass , Tufts College Medical School, Boston, 1911, aged 62, died, Oct 14, 1937, of coronary sclerosis

Josiah W Arthur, Alliance, Ohio (licensed in Ohio in 1897), aged 85, died, Oct 1, 1937, in Massillon, of arteriosclerosis

John Rutter, Poseyville, Ind , Eclectic Medical Institute, Cincinnati, 1881, aged 80, died, Oct 2, 1937, of heart disease

Correspondence

INTERFEROMETRIC BLOOD EXAMINATION

To the Editor—In *Queries and Minor Notes* in THE JOURNAL, November 13, page 1659, the "interferometric blood examination" is designated as "sheer nonsense or worse." The method in question is that employed by Abderhalden for the determination of protective ferments in blood serum. In view of the diagnostic possibilities and the insight into endocrine correlations that may be gained by using Abderhalden's method, this unjustified criticism calls for clarification.

Abderhalden's reaction takes advantage of the fact that the presence of foreign proteins in the blood gives rise to the appearance of specific proteolytic ferments, so called protective ferments (abwehrfermente). Recent further investigations by Abderhalden and his co-workers have furnished evidence that not only ferments against foreign proteins are elaborated by the organism but also ferments against its own proteins, and, what is more striking, against substances that are completely free from protein, as for instance hormones.

The products that are formed by the disintegration of the proteins consist mainly of peptones, which must be separated from the blood serum by dialysis in order to render them detectable by means of the ninhydrin reaction. An essential improvement was made when Paul Hirsch employed an interferometric method instead of the latter chemical test for the detection of the broken-down substances. The interferometric method has several advantages, which lie in its accuracy and high sensitivity. Since "the most important step in the progress of every science is the measurement of quantities" (J. C. Maxwell, in "Theory of Heat") the possibility of performing quantitative determinations with this method makes it extremely valuable.

The application of Abderhalden's reaction to the diagnosis of pregnancy is well known. The principle is that in the blood of pregnant women there is present a ferment which breaks down placental protein, whereas in the blood serum of non-pregnant women this ferment is missing. It has been shown that the same principle is applicable to the diagnosis of cancer, schizophrenia and other conditions. But I shall deal more fully with the results that may be obtained with this method when employed for the diagnosis of endocrine disturbances.

It has been conclusively demonstrated that with the interferometric method reliable and not accidental results may be obtained in the disintegration of various hormonal glands. It is of particular interest that blood serum both from the male and from the female demonstrates breakdown of testicular and ovarian substance in a constant manner, so that sex determination is possible in a high percentage (85%).

It must be said that Abderhalden's reaction has been frequently subjected to criticism. In its infant days, however, unrecognized technical difficulties and mistakes often caused confusion and well deserved criticism. But as a result the method as such was entirely condemned.

An excellent study on the diagnostic possibilities of the interferometric method, based on a series of 235 investigations, was recently presented by Hans Storz (*Ztschr. f. d. ges. exper. Med.* 99:608 [Nov.] 1936), who especially laid stress on its reliability in skilled hands. The first point to be emphasized is that the results are not pathognomonic of any particular disease. The method furnishes more or less unspecific values, having this property in common with most diagnostic methods (determination of the sedimentation rate, and so on). Storz shows that in the same series of diseases, invariably, identical results are obtainable. In cases of hyperthyroidism for instance there is present constantly an increased digestion of thyroid gland and a decreased value for thymus. But he found it impossible to establish a diagnosis by this method alone, as the

investigation of different diseases may reveal completely identical results. For instance there are no differences in curves of disintegration from Simmonds' disease, Addison's disease and exophthalmic goiter. Curves of cases of climacterics with symptoms of virilism may be images of curves from healthy males.

GEORGE ZIPPERT, M.D., New York.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ALLERGY TO WHEAT

To the Editor—I am interested in an occupational disease due to inhalation of macaroni flour. The patient has signs of diffuse bronchiectasis. I have treated him for two months with iodine guaiacol intravenously and he was improved. He went back to work and all the signs came back.

FELIX SCARDAPANE, M.D. Brooklyn

ANSWER—Occupational disease due to inhalation of macaroni or other wheat flours is not uncommon. It usually shows itself as a rhinitis, bronchitis or definite bronchial asthma, which is worse while the patient is working and is improved when the patient stays away from the occupation. Avoidance for a period of from a few days to a few weeks is usually sufficient to clear up the symptoms. Bronchiectasis is uncommon in such patients—it could occur only in long-standing cases as a result of a prolonged siege of bronchitis or bronchial asthma. Instillation of iodized oil should be done to confirm the diagnosis.

The patient should have skin tests, especially for wheat and other cereals. A positive reaction, cutaneous or intracutaneous, would tend to indicate hypersensitivity, especially if wheezing was found, allergic conditions in the family or other allergic diseases, such as hives or hay fever, in the patient himself would aid in the diagnosis of allergy from wheat flour.

Macaroni is made from wheat flour, when semolina, the fine middling from milling hard wheat, is used there is less dust and therefore less chance for allergic reactions. Macaroni workers are not all equally exposed to wheat flour dust. The men who "dump" the flour are most exposed, they are usually covered by the dust. Some plants "dump" with machinery and the amount of dust is minimized. When the macaroni has dried it is sawed to the proper lengths and this operation causes a fine dust that may cause symptoms.

The miller who is sensitive to wheat flour is, according to W. W. Duke (Wheat Millers' Asthma, *J. Allergy* 6:568 [Sept.] 1935) not necessarily sensitive to wheat as a food. He believes that sensitization to the hairs or outer cells of wheat is the commonest cause of cough and asthma among wheat flour millers. In this type of sensitization the patients do not necessarily react clinically or by tests to any other fractions of the wheat grains or to wheat flour. He points out that continuous exposure to wheat dust over a period of years can cause emphysema and debility and may force a change in occupation in spite of therapy, treatment with extract of wheat dust is partly successful but does not protect the patient against unusual exposure to wheat dust.

Colmes, Guild and Rackemann (Studies in Sensitization, *J. Allergy* 6:539 [Sept.] 1935) have shown in a study of thirty-two bakers that clinical sensitivity to wheat occurred infrequently despite long years of exposure to large amounts of wheat flour. This flour, of course, has been milled and is therefore not to be compared with the millers' asthma described by Duke.

If the patient in question is proved clinically sensitive to wheat he should wear a mask while at work, he should be put on a strict wheatless diet, and a list of wheat-containing foods should be furnished him so that he may adequately avoid them. He should also be desensitized, either orally or hypodermically, the oral method has achieved some success, a good method is described by Keston, Waters and Hopkins (Oral Desensitization to Common Foods, *J. Allergy* 6:431 [Sept.] 1935). Albert H. Rowe in a section on wheat allergy in his volume *Food Allergy* (Philadelphia: Lea & Febiger, 1931, p. 336) deals with the subject rather fully. Many men advocate the hypodermic method of desensitization (Unger, Leon. *Food Desensitization in Bronchial Asthma, Illinois M. J.* 44:40 [July] 1923).

DERMATOSIS OF HANDS

To the Editor—An apparently healthy man aged 26 has attacks of deep seated vesicular dermatoses localized entirely to the digits of both hands. The vesicles are pinpoint to pinhead in size discrete and non-inflammatory, and occur on both volar and palmar surfaces extending rarely as far as the palm of the hand. The attack is usually preceded by a few hours with a burning sensation of the fingers the lesions appear in crops last from twelve to twenty four hours and then regress by absorption of the vesicular fluid. There may be from one to as many as seventy five vesicles in each crop. On close inspection many of the vesicles seem to be topped by a pinpoint dark spot. With the exception of scabies five years ago a rather severe acne vulgaris which has abated and a chronic sinusitis and rhinitis the history is immaterial. Until about four years ago the patient was employed in a fur dyeing establishment. Since then he has been working in an advertising agency in which he comes in contact with many of the inks and glues found in a printing establishment. About two years ago while he was visiting in Kansas City this condition broke out for the first time. Since then he has had three other severe attacks and during the interim a continuous breaking out from time to time of a few lesions. According to the patient contact with water causes an exacerbation of this condition. For this reason he has attempted to use as little water as possible by washing in alcohol and using rubber gloves when taking a shower. He has consulted several doctors two of them nationally known dermatologists. Among other things x-ray therapy was tried. Everything so far has failed. I have been using ultraviolet ray therapy which he says has been of more benefit than anything else tried but it has by no means cleared up the situation. Repeated microscopic examination of the lesions and their contents was unavailing. Urinalysis and complete blood count are within normal limits. Careful physical examination reveals nothing of note except a chronic sinusitis and rhinitis. No other foci of infection can be found. My impression has been that this may be a trophic disturbance resulting from irritation of the nerves or spinal ganglions from some focus of infection. Are there any references to such a thing as a sensitivity to water or its contents?

M D Illinois

ANSWER—The patient apparently has a recurrent eczematoid dermatitis of the hands due to contact with irritating substances. The offending agent may be of a chemical, mechanical, animal or vegetable nature. Individual susceptibility is an important factor, the dermatosis itself being an allergic reaction.

The chemicals used in the manufacture of a few dyes, especially paraphenylenediamine, not infrequently produce dermatoses. The inks and glues with which he comes in contact are capable of producing the existing eruption. Water itself may be the exciting factor or may irritate the eruption that exists.

In order to determine the offending agent, patch testing with the suspected irritant may be of value. If no local irritant can be found, all foci of infection should be treated, as a systemic infection may precipitate the local dermatosis. Local treatment with various soothing lotions or ointments as well as the use of ultraviolet therapy and roentgen therapy as indicated should be continued.

HYPERGLYCEMIA WITHOUT GLYCOSURIA

To the Editor—I should appreciate some information concerning the presence of hyperglycemia in the absence of glycosuria. The majority of writers on this subject consider this an aspect of diabetes mellitus and advocate the reduction of the excess blood sugar by diet and insulin. The only article that I can find opposing this stand is that of Mosenthal in *The Journal* Aug 17 1935 p 484.

ARTHUR PEARMAN M D Rockford Ill

ANSWER—Hyperglycemia without glycosuria depends on the existence of a "renal threshold" for sugar which is higher than the average normal. In diabetes mellitus it is seen most commonly in middle-aged or elderly persons, who often have considerable generalized arteriosclerosis with or without hypertension and perhaps chronic nephritis. Cases with extremely high blood sugar values without appreciable glycosuria are occasionally encountered in grave infections or in uremia. If the patient is elderly, if he seems in good general condition, and if the fasting blood sugar is not above 0.20 per cent, it is justifiable to content oneself with a sugar-free urine and to disregard the hyperglycemia. If, on the other hand, the patient is young or of middle age, has a complication such as an infection, ulceration or gangrene from which recovery conceivably might be retarded because of an uncontrolled diabetes, and if the fasting blood sugar is above 0.20 per cent, insulin is indicated. It is probably best not to strive for an absolutely normal fasting value of 0.10 per cent. Protamine insulin in a single injection daily is ideal in such cases.

It must be recognized that hyperglycemia alone does not warrant the diagnosis of diabetes. The patient must at some time or other exhibit glycosuria, and classically both hyperglycemia and glycosuria should reflect variations in the diet, particularly the carbohydrate fraction. In various conditions such as arthritis, hyperglycemia of definite degree with little or no glycosuria may be demonstrated by a dextrose tolerance test, yet such patients may not show symptoms of diabetes over years, despite an unrestricted diet.

Care must be used also in interpreting high postprandial values for sugar when obtained on arterial or capillary blood, particularly if glycosuria does not exist. In a patient recently seen, two tolerance tests with 100 Gm of dextrose were carried out five months apart. During each, glycosuria was absent. In the first, only capillary blood was used and a peak value of 0.24 per cent was obtained. During the second test, venous blood samples were secured, no figure above 0.12 per cent was obtained. The capillary-venous difference after food or dextrose is usually from 0.02 to 0.05 per cent but may be appreciably greater.

A new angle of the problem is suggested by the recent work of Urbach and associates working in Vienna (*Klin Wchenschr* 16 452 [March 27] 1937). They have determined the sugar of the skin, obtaining specimens for analysis by an ingenious method. In certain cutaneous disorders, such as furunculosis and eczema, they claim that they have found an abnormally high skin sugar even with a normal blood sugar and the absence of clinical diabetes. They report that improvement of the condition of the skin and lowering of the skin sugar may follow the use of a restricted diet.

The published discussion following the article cited by the questioner and the remarks made at the Symposium on the Significance of the Blood Sugar of the New York Academy of Medicine, Jan 21, 1936 (*Bull New York Acad Med* 12 277 [May] 1936) present the views of several clinicians on the subject. It seems reasonable to regard a fasting blood sugar above 0.20 per cent as an abnormality and rarely as an asset and to attempt to keep the blood sugar below that value, bearing in mind the exceptions already cited. In the usual case of diabetes it serves as a warning sign of oncoming glycosuria and eventual acidosis. One should have excellent reasons for disregarding it.

HYPERPERISTALSIS AND BORBORYGMUS IN
THE TROPICS

To the Editor—For the past year and a half I have had constant hyperperistalsis plus borborygmus. It has been diagnosed as sprue but the majority of physicians are not in accord with this diagnosis. Nothing has ever been found on microscopic examination of the feces or other excreta. Emetine and liver extract injections have been taken and the latter have done some good. At present I am taking three teaspoonfuls of calcium gluconate daily. My weight is 150 pounds (68 kg.) my usual weight was 170 pounds (77 kg.). I have been in the tropics for the past two years but in a mild climate. I have had malaria and at times feel some traces of it. Could this be brucellosis or could it be sprue? What do you advise as further treatment? I notice that farina cereal foods disagree with me as well as greasy foods. I usually have a normal bowel movement in the morning but about noon there is a copious watery movement preceded by a great deal of rumbling and flatulence. There is no hyperacidity or eructations. My tongue has always been somewhat fissured, but it does not show psoriasis or the characteristics of sprue. Will a cold climate have any influence on the trouble in your opinion? Some physicians recommend acetarsone and neoparsphenamine. Since taking the calcium gluconate in warm water I have noticed a slight amelioration. I am worried about the persistence of this condition.

M D Costa Rica

ANSWER—In all likelihood this condition will require thorough clinical and laboratory investigation before the cause underlying the disturbance can be ascertained. As regards the presenting symptoms, borborygmus is a tangible one, but it was not stated on what basis the presence of hyperperistalsis was determined. As the patient is a physician, it is possible that his interpretation of this subjective phenomenon is correct. The fact that the disorder appeared about six months after residence in a tropical climate implies the necessity of excluding diseases endemic to the tropics, especially sprue and parasitic infestation. The latter would include *Amoeba histolytica*, *Giardia lamblia*, *Taenia*, *Strongyloides stercoralis* and hookworm. Repeated careful examination of the feces, under proper conditions, by a competent parasitologist should confirm or exclude parasitism.

Granting the protean nature of its manifestations, sprue as a causative factor seems unlikely because after one and one-half years of constant symptoms there are no marked nutritional disturbances. In the process of exclusion of this disease, examination of the stools for excess fat, of the blood serum for reduced calcium and phosphorus, of the gastric content for achlorhydria not refractory to histamine, and of the blood for macrocytic anemia would be in order. In addition, dextrose tolerance tests often show low curves for sugar content of the blood, as pointed out by Thayssen. Chronic malaria as a likely factor is highly improbable. Brucellosis could be excluded by specific agglutination and intracutaneous tests. As we are becoming increasingly aware of the frequency of the subclinical and ambulatory forms of brucellosis, the possibility of its presence should always be considered in differential diagnosis, although it is doubtful that this is the cause of the

symptoms If cereal foods alone disagreed, one would think of intestinal carbohydrate indigestion as a possible cause While this condition was by no means unknown to the older clinicians, it has been described recently by Althausen and his co-workers (*Arch Int Med* 56 1263 [Dec] 1935) In such instances the patient frequently complains of gaseous distention associated with abdominal pain or distress, nocturnal colonic distress, and constipation or diarrhea, asthenia or nervousness

If the examinations so far have been without significance, analysis of the gastric content for the presence of achlorhydria, as previously mentioned, would be logical So-called gastrogenous diarrhea, first described by Oppler in 1896, is not uncommon and usually responds promptly to the administration of diluted hydrochloric acid combined with a low residue diet containing adequate vitamins and minerals An x-ray examination of the stomach, duodenum and small bowel following a "progress" barium sulfate meal, and of the colon and terminal ileum following a barium clysm, is also indicated to exclude ulcerative and neoplastic causes In the absence of blood in the feces or rectal discomfort, a proctoscopic examination may not be necessary Successful treatment presupposes successful diagnosis, therefore one hesitates to offer any suggestions in this direction, as it is like shooting in the dark If some tropical disease has not been acquired, and if a neoplastic factor can be excluded, it is not unlikely that a return of the patient to the United States might result in eventual complete recovery

ANTISYPHILITIC TREATMENT AFTER THERAPEUTIC MALARIA

To the Editor—Patients coming to our institution for treatment of dementia paralytica fall into three general groups (1) those having had no antisiphilitic treatment (2) those having had inadequate antisiphilitic treatment and (3) those having had intensive antisiphilitic treatment All of course, are given a thorough physical and laboratory examination and if no contraindications are present, they are inoculated for malaria After there have been some twelve to fifteen paroxysms the malaria is terminated and they are given chemotherapy (arsenicals bismuth compounds) Assuming that no contraindications exist for such postmalarial chemotherapy will you kindly express your opinion on the following points Should all patients, regardless of their premalarial antisiphilitic treatment receive the same postmalarial chemotherapy and for how long? or Should their postmalarial treatment depend on the amount of their premalarial treatment? If the latter kindly suggest a regimen for those who have had no previous treatment for those who have had inadequate treatment and for those who have had intensive treatment

M D, California

ANSWER—It is necessary to emphasize that generalizations regarding the treatment of patients with dementia paralytica are dangerous, treatment should be individualized The postmalarial treatment of such patients can be intelligently carried on only when guided by the results of periodic resurveys, both clinical and serologic So far as generalizations are allowable, however, appropriate treatment systems, with regard to premalarial chemotherapy, are as follows

Patients with dementia paralytica who have received no antisiphilitic treatment previous to malaria should be treated after the cessation of fever, for the first six weeks with six weekly doses of from 0.45 to 0.6 Gm of neoarsphenamine intravenously, as much for tonic and plasmodiacidal effects as for the treatment of syphilis Following this, if appropriate studies reveal no damage to the optic nerve, the patient should be given courses of sixteen weekly injections of trypanamide intravenously, alternating with courses of eight weekly injections of an insoluble bismuth compound intramuscularly The first course of trypanamide should begin with a dose of 1 Gm for the first two injections and, if no visual disturbances develop, the next two injections should be of 2 Gm If these are well tolerated, the next and all subsequent injections should be the full therapeutic dose of 3 Gm This continuous alternating treatment system should be carried to the end of the second course of trypanamide At this time, if no clinical or serologic improvement has taken place, as compared with the status before malaria, none is likely to occur, and the advisability of abandoning further therapy should be seriously considered If improvement has occurred, the same treatment system of sixteen doses of a bismuth compound should be continued for a total of 120 weeks followed by thirty weeks of routine treatment with alternating courses of a trivalent arsenical preparation and a heavy metal, before treatment is stopped

Patients who have had treatment only for early syphilis, irrespective of amount, should be treated exactly as those in the first group

If the patient has received either inadequate or intensive routine treatment, i. e., a trivalent arsenical alternating with heavy metal, for late syphilis, this treatment may be subtracted

from the prescribed thirty weeks of routine postmalarial therapy in the scheme outlined for the first group

There is little information regarding the relative values of trypanamide given before and after malaria, but such as there is indicates that at least a small amount before malaria is actually better than the same amount given afterward It would seem safe therefore to deduct trypanamide given before malaria from the prescribed treatment system for patients in the first group

ABSCESS AFTER STRAIN—TENDON SUTURE

To the Editor—1 A patient developed an abscess on the inner side of the right thigh which he alleges is due to strain while at work The history is that he pushed a small two wheel truck beneath some castings and that as he did this he stood with his legs 2 feet apart and the strain on his right knee caused the abscess He worked at this occupation for about ten days noting some discomfort within three days after he began the work One week after the alleged injury he gave up his job and had a fever of 101 and swelling above the knee Roentgenograms of the knee, hip femur, pelvis and lumbar spine were negative A week later the swollen area was opened and pus was obtained No cultures were taken at that time but four days later staphylococci were obtained from the pus Some of the pus was injected into a guinea pig because of a past history of a psoas abscess Could the strain without direct trauma have produced a soft tissue abscess of the nature described? This man is anxious to apply for compensation 2 A man has a severe compound fracture of the metacarpals of the hand resulting from crushing injury The tendons to one finger were divided but the primary repair consisted only of debridement of the wound closure of the skin and application of traction to hold the fractured bones in position The wound healed by first intention without any fever after the second day How long should I wait before doing a secondary operation to suture the tendons in this case?

M D, California

ANSWER—1 Metastatic abscesses are not uncommon and may occur at the site of some minor injury (*locus minoris resistentiae*) There must however be a focus of infection elsewhere in the body, such as a boil or sore throat, in order to have infection develop at the site of the injury It is not unlikely that the injury in this case was the immediate cause of the abscess

2 Six weeks should be ample time before doing a tenorrhaphy in the second case

NOCTURNAL EPILEPSY

To the Editor—A woman aged 29 has had grand mal convulsions, apparently idiopathic since 25 All the attacks are nocturnal The shortest interval of freedom from attacks has been one month the longest a year and a half In all there have been about six attacks All laboratory examinations such as the Wassermann and examination of the spinal fluid as well as skull roentgenograms are negative Her mother states that in childhood there were a few times when the girl could not be roused from sleep despite slapping I interpret these as missed attacks 1 Owing to the infrequency of attacks do you think the use of phenobarbital is justifiable? 2 Is there any harm from the long continued use of phenobarbital? 3 Do you think the attacks will remain nocturnal or is it inevitable that they start while the patient is awake as well as during sleep? 4 Is mental deterioration inevitable? 5 Can the attacks stay this infrequent or is it usual for the frequency to increase? 6 Is diet of any value in treatment? 7 I would greatly appreciate any further remarks on prognosis and suggestions as to treatment

M D, New York

ANSWER—1 Phenobarbital in order to be of any value in the treatment of the convulsive state must be used constantly despite the fact that convulsions occur infrequently This may be for life

2 Evidence has been advanced to show that phenobarbital, when taken over a long period, may produce mental deterioration

3 Many epileptic patients continue to have only nocturnal attacks even when not on anticonvulsant therapy Occasionally the seizures may occur diurnally in addition to nocturnally When this occurs there usually is an increase in frequency of the attacks One must be cognizant of the possibility of petit mal attacks, isolated motor spasms, various auras and equivalents which are not associated with unconsciousness or convulsions These are included in the entity of epilepsy and must be considered as uncontrolled when they occur if the patient is on a definite anticonvulsant regimen

4 In the majority of patients with the convulsive state, mental deterioration does not occur When it does result it indicates that the patient either has an organic basis for his attacks, belongs to the recalcitrant group which does poorly under any regimen or deteriorates because of medication (phenobarbital) The taking of bromides is not likely to result in deterioration

5 The attacks can remain either infrequent or frequent. If the condition is allowed to go untreated, the frequency may increase

6 Diet in the majority of cases has been found to have no relationship to the frequency of attacks and therefore is of no value in the actual treatment, overeating, however, should never be allowed

7 An absolute prognosis in cases of the convulsive state cannot be given. If the patient has an idiopathic epilepsy it can be said that in about 65 to 70 per cent of these cases the seizures are favorably controlled by the giving of an adequate and proper medication. The remaining 30 per cent do not do well under any regimen and remain recalcitrant. The following regimen is suggested for the patient. Sodium bromide, starting with 13 Gm three times daily. If after a month or more she has another convulsion, the dose should be increased to 16 Gm three times daily. When the amount of sodium bromide necessary to keep her convulsion free is determined, she should be kept on that dose for five years or longer. She must take her medicine regularly. This can be checked by testing the blood serum for bromide content. She should not drink alcoholic beverages, climb heights, drive an automobile or swim. Marriage or at least becoming pregnant should not occur until the patient has been convulsion free for at least five years.

HERPES ZOSTER IN TABES

To the Editor—A white man aged 48, 5 feet 11 inches (180 cm) in height and weighing 190 pounds (86 Kg) has had fairly typical symptoms and signs of tabes since 1933. He had a chancre in 1912 and was given mercury for one year at that time. Since November 1933 he has had 115.2 Gm doses of tryparsamide, forty-six doses of a bismuth compound and fifteen doses of nearsphenamine. His blood test is usually two or three plus by various methods. His spinal fluid shows a two or three plus Wassermann reaction, with traces of globulin and a cell count ranging from two to six. He is symptom free except for very distressing pains in the lower extremities always associated with herpes located in the region of the sacrum and the upper inner quadrant of the buttocks. These attacks which are incapacitating because of the severity of the pain seem to be induced by exposure to cold. There seems to be little information in the literature on herpes in association with tabes dorsalis. Can you get me information as to the relationship of the two conditions and any suggestion as to treatment? M D Washington

ANSWER—Symptomatic herpes zoster may appear during the course of a severe pain crisis of tabes dorsalis. The lesions are usually seen in the lower extremity and occur along the course of the nerves. The herpes may appear during the attack or may appear as the pain leaves. Such herpes suggest the involvement of the dorsal root ganglions by an epidural syphilitic process, which is seen in tabes.

From the history it appears evident that adequate antisiphilitic treatment has been given. It should be continued until the positive reactions disappear. Care should be taken to see that the treatment is not too intensive, a mild form of treatment over a long period might be better tolerated than intensive short treatment. Adequate treatment, however, does not always control the attacks of pain. The following management is suggested: 1 Intravenous injections of sodium thiosulfate in 1 Gm doses three times a week for two weeks. 2 Continuance, after two weeks, of antisiphilitic measures. 3 Careful evaluation of the general health of the patient as to habits as to intemperance in food, alcohol and tobacco, and as to foci of infections in the teeth, tonsils and bladder. 4 Bromides and salicylates, perhaps associated with quinine given regularly, usually prevent the occurrence of frequent and severe pain attacks. Sodium salicylate combined with sodium iodide is often useful. 5 Epidural injection into the sacral canal of from 60 to 90 cc of physiologic solution of sodium chloride or 1 per cent procaine hydrochloride, which will usually prevent the attacks of pain when other measures fail.

ONYCHOMADESIS—SHEDDING NAILS

To the Editor—Each spring pain and tenderness develop in the nail beds of the fingers. This is soon followed by a process—atrophic is the word that best describes it—which seems to cause a shrinkage or disappearance of the tissue of the nail bed and changes the shape of the nail from the normal convex to concave. At the same time the nail can be readily lifted out. The acute phase of this condition continues to the end of June after which repair begins. The advancing edge of the normal nail bed can be made out as the concave shape of the nail is replaced by the convexity of the newer portion. By the end of October the nails again appear normal. This condition has occurred for the past four or five years in a man of 45. The only etiologic possibility is that he works in a garden regularly wearing leather gloves at that time. M D Virginia

ANSWER—The condition described conforms with onychomadesis, which is characterized by the periodic shedding of one or more finger or toe nails. The cause has not been definitely established, although occasionally it may be an accompaniment of an organic nervous disorder. The response to therapy has been uniformly negative.

HYPODERMOCLYSIS AND ABSORPTION OF FLUIDS

To the Editor—1 When was 'hypodermoclysis' first used for the relief of dehydration particularly in connection with surgery? 2 When was the intravenous method first used in this connection? 3 Given a patient with a rather marked dehydration at what rate will fluids be absorbed by proctoclysis? Is it not true that adding anything to the water used in this manner slows up absorption?

J E BRINKMAN, M D Waterloo Iowa

ANSWER—1 and 2 Dr H A Hare, writing on hypodermoclysis in the Reference Handbook for *Medical Science*, 1902, said that "less than ten years ago hypodermoclysis was an almost unknown method of treatment." According to Dr Hare, a paper by Dr Max Hildebrandt of San Francisco (On Hypodermoclysis, *Occidental M Times* 6 317 [June] 1892) was mainly responsible for the application of hypodermoclysis in this country, but it was used sporadically by European physicians much earlier. There are several papers by Dr Weiss in the *Wiener medizinische Presse* for 1888 in which he describes and advocates the use of hypodermoclysis (physiological solution of sodium chloride) as a treatment of acute anemia from hemorrhage as well as treatment of cholera infantum.

3 The rate of absorption of water through proctoclysis will vary greatly, depending on the condition of the large bowel as well as on the solution used. According to Dr George L. Perusse (*Surg, Gynec & Obst* 54 770 [May] 1932), who studied the problem both in dogs and in human beings and used some twenty-one different solutions, 1 per cent dextrose solution is the most efficient. This may be combined with 0.5 per cent sodium bicarbonate, but even this small amount of salt lowers the rate of absorption of water but is probably more efficient in combating acidosis. Of the inorganic salts studied, 0.5 per cent sodium bicarbonate is superior to all others in permitting the greatest absorption of water. Higher concentrations of dextrose or higher concentrations of salts definitely retard the absorption of water from the large bowel, according to Perusse.

CHRONIC STREPTOCOCCIC PHARYNGITIS

To the Editor—A man aged 25 contracted an upper respiratory infection in December 1936. He is a well nourished moderately well developed student with no other complaint. The tonsils and adenoids have been removed. Physical examination shows an injected soft palate and uvula, an inflamed posterior pharyngeal wall and one or two palpable cervical lymph nodes on either side. There is no cough and little pain. A hemolytic streptococcus and two nonhemolytic streptococci have been isolated to which the patient has proved sensitive. He has been receiving autogenous vaccines by subcutaneous injection since February but seems unable to develop any resistance or to make any improvement. Can you suggest any means that would tend to stimulate the development of immunity and what method of treatment would you advise?

MEDICAL STUDENT South Carolina

ANSWER—Conditions such as described are sometimes secondary to sinus infection. When this is the case, drainage of the sinuses helps. Sulfanilamide is reported to be of value in infections due to the beta strain of hemolytic streptococci.

IMPOTENCE FOLLOWING MENINGITIS

To the Editor—A man aged 23 had cerebrospinal meningitis (meningococci) a year ago. At the end of his convalescence it was found that he was deaf. At the present time he complains that he has not had any penile erection since his illness a year ago. His sexual organs appear to be normal. His entire physical examination is negative except for his deafness. What is the cause of his present complaint and what is the treatment and prognosis?

M D Massachusetts

ANSWER—Impotence resulting from cerebrospinal disease is almost always accompanied by bladder symptoms. This seems to be absent in the case mentioned, so that there must be some other cause for the condition, which must be sought for in the genito-urinary system, the cysto-urethroscope being used if necessary. It may, however, be psychic in character and at all events the case should also be investigated by an expert neurologist.

TREATMENT OF EPILEPSY

To the Editor—What is the most recent therapy for epilepsy not jacksonian? I have read somewhere of some serum—one or two doses effective indefinitely.

ROBERT HARTWELL, M D Beaumont Calif

ANSWER—As far as is known there is no serum that is efficacious on the convulsive state when given in one or two doses. Antirabic inoculations and snake venom (moccasin) have been described for the treatment of epileptic convulsions. The former has apparently in a few cases proved to be worth while and warrants further study. It is given as in Pasteur's treatment for rabies. A dose is given daily for twenty-one days. One must not lose sight of the fact that when this anti-

rubic treatment is being given there is a rare possibility of a cerebrospinal complication occurring. This is usually in the form of an encephalitis or encephalomyelitis. The use of snake venom has to date not only proved to be ineffective but has made the patient more susceptible to future attacks. Typhoid inoculations intravenously have similarly proved ineffective.

DIATHERMY IN SINUSITIS

To the Editor—What value has short wave diathermy in the treatment of chronic sinusitis? The information desired is for a patient who has had two radical operations by a first class surgeon and yet still suffers pain every two weeks. If the diathermy is of value what wavelength should be used?

J. R. STRINGHAM, M.D. Cheboygan Mich

ANSWER—Short wave diathermy can raise the temperature in the interior of the sinuses. Whatever value, therefore, that heat may have in the treatment of chronic sinusitis may also be credited to the short wave method of producing heat. Heat, it should be remembered however, no matter how produced, is not a cure-all for sinusitis.

Two operations by a competent surgeon with persistence of pain may mean a number of things. The pain may be due to some other source than the sinuses. The operations which were performed may have been competent enough, but the condition may have been such that no surgery could bring about a complete cure.

There is no need to limit oneself closely to wavelengths. Any of the good machines on the market which will produce heat deep in the tissues can do the work necessary.

THYROID HEMORRHAGE AND CYST

To the Editor—What is your opinion as to the nature of a tumefaction in the region of the left lobe of the thyroid? The isthmus and the right lobe are palpably normal. There are no symptoms of thyroid abnormality, the basal metabolic rate was within normal limits on two occasions. A man aged 35 was in an automobile accident and sustained fractures of the second, third, and fourth left ribs in the mammary line and also a deeply incised wound of the left cheek. On the following day evidence of trauma to the neck appeared in the form of a large hematoma about 3 inches in diameter over the lower half of the left sternomastoid muscle with a moderate degree of pain and stiffness. The hematoma was absorbed leaving a bunch about 2 inches in diameter which protruded about an inch in the region of the left lobe of the thyroid. This remained stationary for about four weeks but suddenly became much larger after a 7 mile walk again subsiding in the following week. The swelling has remained unchanged since. The patient is working steadily and the only complaint is a pressure discomfort particularly when wearing a collar.

M.D. Massachusetts

ANSWER—This man probably had a hemorrhage into the thyroid, which has now become a cyst. Operation would seem to be indicated.

YELLOW AND WHITE PHENOLPHTHALEIN

To the Editor—What are the relative merits of yellow and white phenolphthalein? I understand that the former is a more active purgative but have not prescribed it because I consider it unofficial.

M.D. Alabama

ANSWER—The yellow phenolphthalein is more active than the white. This greater activity is due to the presence of some as yet unidentified highly active purgative constituent present in the 2 per cent yellow extractive that differentiates yellow from white phenolphthalein. The yellow variety probably has no advantage over the white, except for the fact that the former may be given in a dose of smaller bulk. Yellow phenolphthalein is not official.

Council on Medical Education and Hospitals

ABSTRACT OF MINUTES OF BUSINESS MEETING HELD BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS, NEW YORK, NOV 20-21, 1937

The following business was transacted

It was voted to approve the American Board of Surgery

It was voted to adopt the proposed changes in the Essentials of an Acceptable School for Clinical Laboratory Technicians

It was voted to adopt the proposed changes in the Essentials of an Acceptable School for Physical Therapy Technicians

WILLIAM D. CUTTER, M.D., Secretary

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL December 25, page 2162

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II Examinations will be held in all centers where there is a Class A medical school and five or more candidates who wish to write the examination Feb 14-16, May 9-11 (limited to a few centers) June 20-22 and Sept. 12-14. Ex Sec Mr Everett S. Elwood 225 S 15th St Philadelphia

SPECIAL BOARDS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Written examination for Group B applicants will be held in various cities throughout the country April 16. Applications due Feb 15. Oral examinations for Group A and B applicants will be held at San Francisco June 13-14. Sec Dr C. Guy Lane 416 Marlboro St Boston

AMERICAN BOARD OF INTERNAL MEDICINE Examinations will be held in various centers of the United States and Canada Feb 14. Chairman, Dr Walter L. Biering 406 Sixth Ave Suite 1210 Des Moines Iowa

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written examinations and review of case histories for Group B candidates will be held in various cities of the United States and Canada Feb 5. General oral clinical and pathological examinations for all candidates (Groups A and B) will be conducted in San Francisco June 13-14. Application for admission to Group A examinations must be on file before April 1. Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh (6)

AMERICAN BOARD OF OPHTHALMOLOGY San Francisco June 13. All applications and case reports in duplicate must be filed at least sixty days before the date of examination. Sec Dr John Green 3720 Washington Blvd St Louis Mo

AMERICAN BOARD OF ORTHOPAEDIC SURGERY Los Angeles June 14-15. Sec Dr Fremont A. Chandler 6 N Michigan Ave Chicago

AMERICAN BOARD OF OTOLARYNGOLOGY San Francisco June 10-11. Sec Dr W. P. Wheary 1500 Medical Arts Bldg Omaha

AMERICAN BOARD OF RADIOLOGY San Francisco June 10-12. Sec Dr Byrl R. Kirklin 102 110 Second Ave S W Rochester Minn

Pennsylvania July Examination

Dr James A. Newpher, secretary, State Board of Medical Education and Licensure, reports the examination held at Philadelphia and Pittsburgh, July 6-8 1937. Four hundred and ninety-seven candidates were examined, 494 of whom passed and three failed. The following schools were represented

School	PASSED	Year Grad	Number Passed
Yale University School of Medicine	(1935 2)		2
George Washington Univ. School of Medicine (1935)	(1936 4)		5
Georgetown Univ. School of Medicine (1935 2)	(1936 25)		21
Howard University College of Medicine	(1936 3)		3
University of Georgia School of Medicine	(1936)		1
Loyola University School of Medicine	(1937 3)		3
Northwestern University Medical School	(1937)		1
Rush Medical College	(1937 3)		3
University of Kansas School of Medicine	(1936)		1
University of Louisville School of Medicine	(1936)		1
Tulane University of Louisiana School of Medicine	(1934)		1
University of Maryland School of Medicine and College of Physicians and Surgeons	(1936 10)		10
Boston University School of Medicine	(1936)		1
Harvard University Medical School (1933)	(1935 3)	(1936)	5
University of Michigan Medical School	(1936 7)		7
St. Louis University School of Medicine (1932)	(1936 7)		8
Creighton University School of Medicine	(1933)		1
University of Nebraska College of Medicine	(1935)		1
Albany Medical College	(1936)		1
Cornell University Medical College	(1935)	(1936)	2
Long Island College of Medicine	(1933)		1
University of Buffalo School of Medicine	(1936)		1
Duke University School of Medicine	(1936 2)		2
Eclectic Medical College Cincinnati	(1936)		1
Ohio State University College of Medicine	(1936)		1
University of Cincinnati College of Medicine	(1937)		1
Western Reserve Univ. School of Medicine (1936)			2
Hahnemann Medical College and Hospital of Philadelphia	(1935) (1936 59)		60
Jefferson Medical College of Philadelphia (1934)	(1935 25), (1936 60)		86
Temple Univ. School of Med (1934 3)	(1935 14) (1936 7)		92
University of Pennsylvania School of Medicine (1933)	(1934 4) (1935 29) (1936 43)		77
Univ. of Pittsburgh School of Medicine (1936)	(1936 59)		60
Woman's Medical College of Pennsylvania (1935)	(1936 11)		12
Meharry Medical College	(1934)		1
University of Texas School of Medicine	(1935 2)		2
Medical College of Virginia	(1936 2)		2
University of Toronto Faculty of Medicine	(1910)		1
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England	(1936)		1
Friedrich Wilhelms Universität Medizinische Fakultät Berlin	(1935)†		1
Johann Wolfgang Goethe Universität Medizinische Fakultät Frankfurt am Main	(1933)		1

Ludwig Maximilians Universität Medizinische Fakultät München	(1921)†	1
Medizinische Akademie Düsseldorf	(1932)†	1
Regia Università degli Studi di Benito Mussolini di Bari Facoltà di Medicina e Chirurgia	(1935)‡	1
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia	(1935)†	1
Universität Basel Medizinische Fakultät	(1935)†	1
SCHOOL FAILED		
	Year Grad	Number Failed
University of Georgia School of Medicine	(1936)	1
University of Pennsylvania School of Medicine	(1936)	1
Marquette University School of Medicine	(1937)	1

Twenty-seven physicians were licensed by reciprocity and 28 physicians were licensed by endorsement from January 22 through October 14. The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Georgetown University School of Medicine (1931) Vermont	(1895)	New York	
Howard University College of Medicine	(1930)	Georgia	
Loyola Univ. School of Medicine (1932) New Jersey	(1935)	Ohio	
Northwestern University Medical School (1914)	(1927)	Illinois	
Rush Medical College	(1926)	Illinois	
State University of Iowa College of Medicine	(1932)	Iowa	
Johns Hopkins University School of Medicine	(1928)	California	
University of Maryland School of Medicine and College of Physicians and Surgeons	(1935)	Maryland	
Detroit College of Medicine and Surgery	(1933)	Michigan	
University of Michigan Medical School	(1931)	Michigan	
St. Louis University School of Medicine	(1933)	Michigan	
Washington University School of Medicine	(1905)	Missouri	
University of Nebraska College of Medicine	(1934)	Nebraska	
New York University University and Bellevue Hospital Medical College	(1933)	New York	
Duke University School of Medicine	(1933)	New Jersey	
Ohio State University College of Medicine	(1928)	Ohio	
University of Cincinnati College of Medicine	(1935)	Ohio	
Hahnemann Medical College and Hospital of Philadelphia	(1931)	(1936) New Jersey	
Jefferson Medical College of Philadelphia	(1931)	(1927) Connecticut	
University of Pennsylvania School of Medicine	(1930)	New Jersey	
Woman's Medical College of Pennsylvania	(1935)	New Jersey	
Medical College of the State of South Carolina	(1934)	S. Carolina	
University of Tennessee College of Medicine	(1927)	Tennessee	

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Georgetown University School of Medicine	(1936 4) N B M Ex	(1931)	
Harvard University Medical School (1928)	(1929)	(1931)	
(1933) (1935) N B M Ex			
Tufts College Medical School	(1932)	(1935) N B M Ex	
University of Michigan Medical School	(1930)	(1935) N B M Ex	
University of Minnesota Medical School		(1935) N B M Ex	
Washington University School of Medicine		(1931) N B M Ex	
Cornell University Medical College		(1935 3) N B M Ex	
New York University College of Medicine		(1935) N B M Ex	
Duke University School of Medicine	(1934)	(1935) N B M Ex	
Jefferson Medical College of Philadelphia	(1933)	(1936) N B M Ex	
Temple University School of Medicine		(1936) N B M Ex	
Univ. of Pennsylvania School of Medicine	(1933)	(1936) N B M Ex	
Woman's Medical College of Pennsylvania		(1935 2) N B M Ex	

* License withheld pending completion of intern credentials

† Verification of graduation in process

‡ License withheld pending completion of foreign credentials. Verification of graduation in process

Montana October Examination

Dr. S. A. Cooney, secretary, Board of Medical Examiners, reports the examination held at Helena, Oct. 5-6, 1937. An average of 75 per cent was required to pass. One candidate was examined and passed. Eighteen physicians were licensed by reciprocity and one physician was licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad	Per Cent
University of Minnesota Medical School		(1937)	82.5
SCHOOL LICENSED BY RECIPROCITY			
		Year Grad	Reciprocity with
College of Medical Evangelists	(1934)	(1937)	California
University of Colorado School of Medicine		(1935)	Colorado
Northwestern University Medical School		(1937)	Colorado
Rush Medical College		(1935)	N. Dakota
University of Illinois College of Medicine		(1911)	N. Dakota
State University of Iowa College of Medicine		(1923)	Iowa
University of Louisville School of Medicine		(1936)	Kentucky
University of Minnesota Medical School	(1930 2)	(1931)	
(1933) (1934) (1936) * (1936) (1937) Minnesota			
St. Louis University School of Medicine		(1936)	Missouri
University of Nebraska College of Medicine		(1934)	Missouri

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Cornell University Medical College		(1935) N B M Ex	

* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship.

Book Notices

Diseases of the Heart Described for Practitioners and Students. By Sir Thomas Lewis, CBE, FRS, MD, Physician in Charge of Department of Clinical Research, University College Hospital, London. Second edition. Cloth. Price \$3.50. Pp. 297 with 45 illustrations. New York: Macmillan Company, 1937.

The first edition of this work appeared in 1933. The purpose of the author, as clearly stated, was not to write a treatise on heart disease or a book of reference but a compact manual that would help practitioners to recognize and properly treat the commoner diseases of the heart. The work was iconoclastic. Old classifications were discarded, morbid anatomy, both gross and microscopic, was relegated to an inferior position, disturbed function was regarded as the explanation of practically all symptoms. The laboratory as an aid to diagnosis was relatively ignored, both because it was regarded as of little worth and also because the general practitioner would "soon lose all connection" with it. The text was stripped bare of unnecessary verbiage and of bibliographic references. Discussion of unsettled theories was avoided. Simplicity was the rule. The two heart conditions that counted for much and that needed more than casual consideration were cardiac failure and angina pectoris. The book was provocative. Physicians took sides as to its merits. One well informed practitioner declared that it was the best book on heart disease that had ever been written. Another sentimentously sniffed "Rotten." It is not difficult to understand these divergent views. With his exceptional command of terse, vigorous English, Sir Thomas drew pictures of disease with the lines as distinct as in a first state etching. His chapters on angina pectoris, coronary thrombosis, paroxysmal tachycardia, effort syndrome, rheumatic carditis, hypertension, arteriosclerosis and syphilis of the heart were marvels of clarity and were wittily packed with sound sense and helpful hints as to treatment. No wonder they elicited enthusiastic praise. But there was a certain *ex cathedra* tone on the part of the famous laboratory investigator who, after some twenty years of clinical experience, presumed arbitrarily to select his own rules for diagnosis, tossed out at will signs and symptoms as valueless because they were not what he himself "had seen and proved to be true" or because—with an air of condescension—he thought the practitioner could not understand them or properly utilize them in practice. All this was, to say the least, somewhat irritating to studious, progressively minded practitioners. Then there was inconsistency in the author's attitude. While claiming to avoid controversy, he argued as an advocate when he minimized the importance of the systolic murmur and mitral regurgitation or magnified the importance of mitral stenosis, discussing in minute details the various features of its murmur. He was vehement in his denunciation of the use of the term "broken compensation" and had a very poor opinion of those who still believed in the mechanical, back pressure theory, reasons for which belief he hardly stated fairly. There were many omissions that excited comment, but this could not justly be called a fault, for what should be included in a book written with the author's purpose would largely be a matter of opinion. This partially accounts also for a weakness in differential diagnosis. These were some of the characteristics of the first edition of 1933. The second edition is essentially a reprint, though it is stated that "the text of the first edition has been revised thoroughly and all recent and relevant advances in our knowledge, which it is judged will prove of value to practitioners, have been incorporated." The revision of the text seems to be little more than better proof reading. To judge from the paucity of additions, Sir Thomas feels that almost none of the recent advances in our knowledge are relevant or have any value to practitioners. Incidentally, it may be said that the number of pages, 297 including the index, is exactly the same as in the first edition. In conclusion, this book is not suited to the needs of the undergraduate. It can, however, be read with great profit by the practitioner who desires to get the views of Sir Thomas Lewis concerning the clinical aspects of heart disease. If these views are not always as well grounded and convincing as was the investigative laboratory work of his earlier and perhaps clearer minded years, they are yet keenly critical, full of much truth that needed expression. They are

views that deserve most serious consideration even from those who may not always agree or who may think him at times inconsistent. The book, as its author intended it to be, is a challenge. It is stimulating in the best sense.

Epidemiologie Grundbegriffe und Ergebnisse Von Prof. Dr. med. Adolf Gottstein. Ministerial Direktor I R. Berlin. Paper. Price 15 marks. Pp 285 with 16 illustrations. Leipzig & Vienna. Franz Deuticke 1937.

This presents the reflections of one of the world's most experienced epidemiologists, and that, if for no other reason, would make the book noteworthy, there are however, several other reasons for its usefulness. It is to be stated at the beginning that the book is not a textbook nor is it a "handbuch" it is a purely personal survey and digest. As such the book is distinctly stimulating and definitely provocative. It had its inception in the effort of a mind crammed with direct experience to evaluate that which is of value in the recent literature. It is this personal experience that is possibly reflected in the rejection of some very modern concepts, but such rejection is never arbitrary but always backed by a very elaborate marshaling of the evidence. The book is divided into approximately two equal parts, the first theoretical, while the second is concerned with the more practical aspects of the epidemiology and is perhaps the more valuable. This impression may in part be due to the fact that the first half is somewhat obscure in phraseology. As a result of this obscurity the direct line of thought which forms the basis of the exposition is at times difficult to follow and requires some patience. For this expenditure the reader will, however, be amply compensated. Gottstein is most positive in his belief that definite progress in epidemiology can only follow further advances in the medical fields of the collateral sciences and the borderline of scientific endeavor not directly concerned with medical problems.

Illness and Medical Care in Puerto Rico By Joseph W. Mountin. Surgeon Elliott H. Pennell. Associate Statistician and Evelyn Flook. Assistant Statistical Clerk. Prepared by direction of the Surgeon General U. S. Treasury Department Public Health Service. Public Health Bulletin No 237. Paper. Price 15 cents. Pp 63 with 19 illustrations. Washington D. C. Supt. of Doc. Government Printing Office 1937.

Puerto Rico has for many years operated a system of public assistance which combines medical care with other relief methods. The gross area of this and the adjacent islands is 3,435 square miles. In 1930 the population of this area was 1,543,913, thus the average number of inhabitants is about 450 per square mile. Less than 1 per cent of the population is foreign born, about 75 per cent is white, the remainder consisting of Negroes. The income of Puerto Rican families varies considerably. The median annual income of the rural families is \$88 and of the urban families \$137. Diet consists of rice and beans twice a day, coffee with unrefined sugar and with or without milk, twice or three times a day, very small quantities of bread, usually without butter, tuberous vegetables, and fruit in small quantities, chiefly for children. The housing conditions are marked by severe crowding, especially in sleeping room accommodations, 30 per cent of the rural families studied have only one sleeping room for nine or more persons. The death rate in Puerto Rico is extremely high when compared with that of the continental United States. Malaria, hookworm, nutritional disorders, infant mortality and tuberculosis appear to be the most urgent health problems on the island. The median duration of bed illness in Puerto Rico is eleven days, while the median duration in a particular surveyed section of the continental United States is seven days. The number of persons per physician is approximately 4,000, varying from 2,000 to 9,000. If only the 131 municipal physicians are considered and related to the total population, the corresponding ratios vary from 8,350 to 15,400 persons per physician. Fifty-five per cent of the available general hospital beds, or 1,901, are located in municipal hospitals. While funds assigned to medical care are manifestly inadequate for providing satisfactory service to those in need, it is recognized that the municipalities allot a reasonable share of their total revenue to this purpose. A complete medical service would cost several times what is now being spent. A definite reduction in the present sickness burden could be effected by bringing under control such preventable conditions as malaria, hookworm, dysentery and tuber-

culosis and by improving the nutritional status of the population. Grave doubt exists in the minds of many civic and professional leaders as to whether the municipality should be retained as the basis of organization in any scheme for medical care. This report is a clear, concise statement of health and medical conditions in Puerto Rico. The tables that accompany the text provide an illuminating comparison between the island and the continental United States.

Les épidémies et l'histoire Par Albert Colnat. Collection Hippocrate. Directeur Professeur Laignel Lavastine. Paper. Price 30 francs. Pp 101 with 56 illustrations. Paris. Editions Hippocrate 1937.

Sanitation, quarantine and the watchfulness of the public health service have so relieved the modern world from fear of major epidemics or concern about them that we have forgotten what they did through the long centuries to war-cursed humanity. In this small volume is compressed the story of the invincible microbe, which even now competes with high explosives in the war-stricken Orient for its victims.

The book is a historical review of the world's great epidemics from both the medical and the historical point of view. The skill of generals, the valor of soldiers and the wealth of the Indies avail nothing when typhus, pest, malaria, dysentery, yellow fever and cholera enter the field. Every army left behind it a train of the invincibles, who ravaged the cities and country side without respect to victory or defeat. Their victims often outnumbered those of the sword, and the slaughter continued long after the scars of battle had disappeared.

The author reviews the great events of military history from the wars of the Spartans and Athenians down through the last century, showing how often the course of history was determined not by military skill and prowess but by disease. He notes particularly the invasion of the black rat, *Mus rattus*, into Europe from the Near East, where it lived in the wild state. It came with returning crusaders and by the end of the thirteenth century had spread throughout Europe, affording with its fleas a new menace and an increased hazard in plague because of its intimate association with ships, trade and urban life. Hence the story of the Pied Piper and the recurrent epidemics of plague in the sixteenth century, during the Thirty Years' War, and in the seventeenth century. It was displaced in the eighteenth century by the brown rat, *Mus decumanus*, its ferocious enemy, arriving in Europe from central Asia.

The author reviews the evidence for the effects of these great epidemics on the psychology of the people, resulting in the dissolution of long established social inhibitions, the break down of mores, the decline of morals and of respect for life and property, and the upward surge of superstitions of all sorts. The black death, for example, gave rise to roving bands of plundering flagellants. The morale of the French armies in Egypt and Syria was broken by plague, in the retreat from Moscow by dysentery and typhus, and in Santa Domingo by yellow fever.

The diffusion of syphilis in Europe is credited by the author to the infected sailors returning from Haiti, and he attributes to it a series of far-reaching social consequences, or at least influences, affecting revival of morals and the Reformation with its austerities, the general adoption of shaving the beard and moustache, the abandonment of wigs and the wearing of shorter hair, changes in fashions, and the rise of the perfume industry.

The nineteenth century was the age of cholera. An outbreak in India in 1817 was marked by high mortality and the disease spread quickly by land and sea to the Philippines and China and by 1821 reached Turkey and Russia. It revived in 1826 in Bengal and spread westward into Persia and Russia, where the Polish revolt aided its invasion of Germany in 1831. It reached London and Paris in 1832, ending its European invasion in 1837 but reviving several times during the century, with a total of more than a million deaths.

The result of these recurrent epidemics with their sudden assaults and high mortalities was increased scientific attention to water supplies and sewage. Cholera was the parent of modern sanitation.

The book is illustrated by reproductions of plates in early works on disease and military affairs. Unfortunately the sources of this historical account are omitted. What a pity that our historians did not have the physician's knowledge of disease, its sources and its significances.

A Textbook of General Biology By E Grace White Ph D Professor of Biology Wilson College Chambersburg Pa Second edition Cloth Price \$3 Pp 667 with 336 illustrations St Louis C V Mosby Company 1937

This book is the outgrowth of the course of instruction in biology given at Wilson College in Chambersburg, Pa., during the last ten years. The material was used in class work in mimeograph form for several years and it had the advantages, therefore, of improvements and criticisms from practical use. The book opens with the following statement "Biology is the science of life. It is concerned with all things that live, with their structures, their functions and their activities, physical and chemical, and psychological." A general biology course admits of many lines of approach. It must lay the foundation for future work in special fields and at the same time satisfy the student's curiosity about life and arouse a wide interest. This book is arranged in three parts. Part one treats of life as a whole, a typical animal, a typical plant, typical one celled life, and bacterial life. Questions of action and interaction, organization, variation, life, death and reproduction are introduced. Part two treats of the animal and plant kingdom, including the morphology and life history of each. Part three discusses problems of modern biology and related subjects. The book is well illustrated and there is an extensive glossary. The closing chapters are devoted to such subjects as chordate organization, adaptation of animals and classification of animals—phylogeny. In this edition the author has strengthened the book by some rearrangements and by adding new material, including fifty-three new illustrations.

Sarnoff Surgical Motion Picture Library Index By Jacob Sarnoff M D Attending Surgeon Israel Zion Hospital Brooklyn New York Available to Medical Schools and the Medical Profession Paper Pp 24 Brooklyn New York The Author [n d]

The index contains a list of more than 300 motion pictures, many of them in color, made by the author over a period of years. In a foreword to the index the author seeks "to encourage the use of these films for the teaching of students in every medical school and for postgraduate teaching." The prediction is made that "the time is not far off when those who do not avail themselves of such means of information, be they medical schools or practitioners of medicine, will be considered antiquated." If all the pictures in the index are of "acceptable" quality, a real contribution to medicine has been made. No other physician in the country has published a list nearly as long. The remarkable number, however, makes one wonder how much care was used in the selection of cases. Physicians are referred to several articles on motion pictures which the author has prepared for various magazines.

Les grandes endémies tropicales Études de pathologie et de prophylaxie Neuf conférences faites au grand amphithéâtre de la Faculté de médecine de Paris (du 11 Mars au 30 Mars 1936) par MM les médecins du corps de Santé Colonial Labernadie Blanchard Alain Passa Cousin Laurence Girard Robineau et Peltier (Huitième année) Publiées sous la direction de M le Professeur Tanon Institut d'hygiène de la Faculté de médecine de Paris Inspection générale du Service de santé au ministère des colonies Paper Price 18 francs Pp 167 with one illustration Paris Vigot Frères 1936

This series of lectures at the Institute of Hygiene by the physicians of the Sanitary Corps of the Public Health Service of the Colonies includes a survey by Lieutenant-Colonel Labernadie of the medical geography of French India, three small regions containing 300,000 Hindus. Colonel Passa reports on the tropical diseases in Guadeloupe in the Caribbean, Lieutenant-Colonel Laurence on those of Indo-China, and Lieutenant-Colonel Peltier on those of the coast of Somaliland. In all these surveys one notes the preeminent medical importance of malaria. Colonel Blanchard discusses hydrophobia in the French colonies, reporting its presence in all French colonies. Reports of nontransmissibility of the virus from dogs to man in Africa are explained by faulty technique and incomplete observation. It is prevalent and highly virulent in Indo China, where Buddhist influence prevents the destruction of vagrant dogs. Captain Alain discusses climatic bubo and venereal lymphogranuloma, and Commandant Cousin describes practical small-scale methods of insuring safe drinking water in the tropics by the use of alum and chlorination. Lieutenant-Colonel Girard

reports the use of virus vaccine E V against plague endemic in Madagascar on 500,000 persons. The results were good. Commandant Robineau reports on leprosy in French West Africa, where 450 patients come for treatment. Treatment with chaulmoogra derivatives is utilized, and encouraging results are reported on comparable derivatives of gorli, used in both intramuscular and intradermal injections.

Nursing as a Profession By Esther Lucile Brown Boards Price 75 cents Pp 120 New York Russell Sage Foundation 1936

This monograph is one of a series dealing with the present status of certain established or emerging professions. Much of what has been written about nursing in the past ten years is here summarized. The author, at the outset, asks the question "Is nursing a profession?" but the answer does not emerge, perhaps because a satisfactory definition of "profession" is lacking. Nursing schools are described and there is the usual discussion of entrance requirements, curriculum and relationship to hospitals. The importance of economic factors in determining the supply and distribution of nurses is clearly presented and the needs and opportunities in the public health field are duly stressed.

Rural Negro Health A Report on a Five Year Experiment in Health Education in Tennessee By Michael J Bent M D and Ellen F Greene M A for The Joint Health Education Committee Paper Pp 85 Nashville Tennessee Julius Rosenwald Fund 1937

In this report attention is focused largely on testing psychological theories and pedagogic techniques in the conduct of health education. Educational work was devoted to environmental, institutional and individual factors. The results of teaching were tested by questionnaires to show progress. An outline of a course in health education for personal and community hygiene given at Fisk University and Agricultural and Industrial State College of Tennessee is included. There is a bibliography and a list of motion pictures available for the conduct of health education. The report constitutes a valuable elementary manual for health education in this particular field.

Report of the Committee on Tuberculosis Among Negroes A Five Year Study and What It Has Accomplished Paper Pp 77 New York National Tuberculosis Association 1937

Southern rural communities, according to this report, are largely unable to finance adequate tuberculosis control measures. The greatest disparity between white and Negro death rates, however, is found in the Northern states, where the "colored mortality is more than five times that of the white population." The study led to the belief that, while there were dysgenic racial factors among the Negroes in relation to tuberculosis, "poor housing, inadequate medical care, malnutrition, and lack of education combined to constitute an environmental factor which accounts in a very considerable part for the excessively high death rates from tuberculosis." Measures of institutional control, considered of so great importance in tuberculosis, are rendered difficult, if not impossible, by the fact that the states containing the largest Negro population have financial resources wholly inadequate to establish the necessary institutions. Emphasis is placed on the need for developing a trained Negro personnel capable of meeting the problems. An extensive bibliography is included.

Étude sur la médecine de l'homme préhistorique Par le Docteur Julio Janc de la Faculté de médecine de Paris Paper Pp 54 Paris E L. François 1934

Medical art had a relatively small place in the defenses of primitive man, as revealed by radiography of fossil bones and comparative pathology and parasitology. Magic rites assumed a larger role than therapeutic procedures, although an elementary form of surgery concerned with the reduction of fractures and the dressing of wounds was practiced early. As far as bone lesions reveal the story of primitive man's diseases, they were those still prevalent today: tuberculosis of the bone, cancer, Paget's disease and probably syphilis. Fractures, both consolidated and not suggest efforts at reduction. In the light of paleopathology and prehistory the oldest known medical writings were antedated by millenniums of primitive arts of medicine and surgery.

An Introduction to Dermatology By Richard L. Sutton M.D. Sc.D., LL.D. Professor of Dermatology University of Kansas School of Medicine and Richard L. Sutton Jr. A.M. M.D. L.R.C.P. Instructor in Dermatology University of Kansas School of Medicine Third edition Cloth Price \$5 Pp 666 with 229 illustrations St. Louis C.V. Mosby Company 1937

The third edition of "Introduction to Dermatology" by the Suttons is characterized by many new photographs and the addition of descriptions of some forty diseases not included in the previous editions. Although the discussions of some of the diseases are short, descriptions of practically all the diseases of the skin and mucous membranes are included. A liberal amount of space is given to syphilis and its treatment. The only criticism that can be offered is with regard to more adequate discussion of the spinal fluid examinations in syphilitic patients. The book is highly recommended as a manual for the medical student and the general practitioner.

Quelques vérités premières (ou soi disant telles) sur les maladies infectieuses Par A. Lemierre professeur de Clinique des maladies infectieuses à la Faculté de médecine de Paris. Collection publiée sous la direction de MM. L. Ombrédanne et N. Flessinger. Boards. Price 24 francs Pp 77 Paris Masson & Cie 1937

This neat little cardboard covered volume is one of a series of which nine others have appeared each dealing with a limited medical subject, in this instance with the infectious diseases. Each chapter consists of a number of dogmatic statements, not unlike the aphorisms of Hippocrates, that are assumed to be established facts with reference to the disease under discussion, all matters of controversy being omitted. The chief interest to nearly all American readers probably lies in a comparison of these views of an authoritative French clinician with our own. To the experienced clinician in this country there is little, if anything, new in this presentation but he will be interested to find how fully he is in accord with these clearly stated aphorisms from a foreign source.

Synthetische Morphologie der Niere des Menschen Bau und Entwicklung dargestellt auf neuer Grundlage Von Prof. Dr. Martin Heidenhain. Paper. Price 10 guilders Pp 270 with 90 illustrations. Leiden E. J. Brill 1937

This monograph represents a highly detailed and technical exposition of the development of the human kidney. The gross anatomy of the kidney is first presented along conventional lines. The author shows how the kidney is developed from the two anlagen, the ureterogenic, essentially epithelial in nature, and the nephrogenic, which consists of indifferent mesenchyme. The histology of the kidney and especially the epithelial content is described in great detail. The account of the development of the excreting and collecting tubules forms the greater portion of the text. The author's large contribution is his demonstration that the epithelial content of the kidney is the result of a prodigious and continuous splitting of the collecting tubules. The epithelial cells possess a tremendous dynamic potentiality, transferred from one cell to another by intercellular bridges. The illustrations are numerous and beautifully executed. To those interested in the development of the kidney, this book should prove indispensable.

Handbook of Therapy Edited by Morris Fishbein M.D. Editor Journal American Medical Association Chicago. From the Handbook of Therapy by Oliver T. Osborne and Morris Fishbein. Eleventh edition. Fabrikoid. Price \$2 Pp 812. Chicago American Medical Association 1937

More than 115,000 copies of the various editions of this book have been sold. The secret of this success lies partly in the fact that the book can be readily carried in the coat pocket, it is flexible, good looking, does not appear crowded, and it contains a summary of the most recent treatment of practically all the diseases. In this revision there begins on page 744 a summary of the recent treatment of syphilis as described in a series of special articles published in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION last year. Some additional new material has been added and some methods that have become obsolete have been deleted. The usefulness of this book has been proved by its wide popularity, and the new edition maintains the high standard set by its predecessors.

Miscellany

MEDICAL EDUCATION IN THE NETHERLANDS INDIES

The American consul at Batavia, Java, recently submitted a report to the Secretary of State in Washington, D. C., entitled "Medical Education in the Netherlands Indies." The tenth anniversary of the University Medical School in Batavia was celebrated Aug. 16, 1937. Prof. Dr. A. Grevenstuk, chairman of the Faculty of Medicine, gave an address, which was followed by a talk on "The Responsibilities of a Surgeon to His Patients" by Dr. T. Reddingius, professor of surgery and secretary of the faculty for the coming year.

In 1851 a school was established in Batavia to train native born persons for the practice of medicine. At first a two year course was given, but it was extended to three years in 1864, and still further to two years premedical work and five years medical study in 1875. The curriculum was modernized in 1902 and the name of the school changed to "The School for Training Native Doctors." At that time the entire matter was in the hands of the military medical service, but the arrangement was unsatisfactory and in 1920 the entire medical course was centered in a new group of buildings in Batavia adjoining the new Municipal Hospital and the Laboratory of Medical Sciences. In 1927 the government raised the school to university rank. Shortly afterward the school became recognized by the old Netherlands universities and arrangements were made for the interchange of professors with universities of Leyden and Utrecht.

At present this school has a full faculty of professors and lecturers. The buildings are imposing and the equipment compares with that of any school of medicine anywhere. The medical students have for teaching purposes the facilities of the 2,000 bed Central Civil Hospital, which adjoins the medical school and whose outpatient departments are attended by several hundred patients a day, giving a large variety of clinical material.

The number of freshman students in the last year was 112 and of the total student body was 552. The students come from all races of the country, with about 20 per cent Europeans, 35 per cent Chinese and 45 per cent natives. During the last ten years, fifty-two students who entered the school have been given diplomas. The course covers seven years, including the three years of theoretical and four years of practical work. Thus the time required, as well as the examinations, approximate those required in America.

The first examination, the "candidaat," covering the premedical subjects, is taken in two parts with one year between them. Then comes the "doctoraal," which covers the field of theoretical medicine and is taken in two parts with a year between them. Then after fourteen months of study in the wards comes the "seminars" examination in tropical medicine, pediatrics, pharmacy and neurology. From eighteen to twenty months later the student may take his final or "arts" examination, including surgery, obstetrics, gynecology, ophthalmology, roentgenology, dermatology, urology, forensic medicine and dentistry, which is a compulsory subject for all doctors here. The University Medical School being a government institution, there is no additional examination which corresponds to state board examinations in the United States.

A speaking and writing knowledge of both the Netherlands and the Malay language is essential. The examinations are all held orally before a committee of three examiners, any or all of whom may ask questions and all of whom the candidate must satisfy to pass. Whether a candidate passes or fails depends less on his medical knowledge than on the impression he makes on the examining committee. Failure in one subject necessitates taking the entire examination over. It is extremely difficult at present for any foreign physician to secure permission to practice in the Netherlands Indies. No foreign physician is excused from the three years work in the hospital wards that is required as a preliminary before one may take any of the examinations, and no one may be excused from the "seminars" and "arts" examinations unless one has passed similar examinations in the Netherlands and furnishes proof of years of experience in tropical medicine. In the earlier days of medical

training in the Netherlands Indies it was not difficult for a foreign physician to qualify to practice and many of them went there soon after the World War. Since the University Medical School was founded, the requirements for foreigners have become stricter each year until it is practically impossible for a foreigner to obtain a license. Foreign physicians are not wanted and the increasing difficulties placed in their way are designed to keep them out.

An important phase of the development of this medical school is that it represents another step in making the Indies less dependent on the Netherlands for its academic classes. Until recently the majority of the physicians in the Netherlands Indies came from one of the great universities of the Netherlands. That a marked change in this regard has taken place is shown by the fact that three years ago regulations similar but much less stringent than those applied to foreigners were made with respect to graduates of Netherlands universities desiring to practice here. No such candidates who are graduated physicians are exempted from the "candidaat" and "doctoraal" examinations. Their preliminary compulsory service in the hospital, however, is reduced to one year instead of three.

It is not possible to work one's way through a university course in Batavia, simply because the faculty does not regard it as being consistent with the dignity of a physician.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Authority of Agent of Corporation Furnishing Offices to Clinic to Guarantee Income to Physician—Several physicians, including Dr. W. O. Sweek, in Phoenix, Ariz., decided to form a clinic. A layman, Grunow, organized a corporation, known as the Lois Grunow Memorial Clinic, to finance the construction of a building properly equipped wherein the physicians comprising the clinic might have their offices, such physicians to pay a suitable rent to the corporation. The sole members of the corporation were Grunow and Dr. Sweek. By resolution, Dr. Sweek was authorized to enter into agreements for the rental of space in the corporation's building for such periods as he saw fit. Apparently, this was the only act of the corporation authorizing any person to act as its agent.

Acting under this resolution, Dr. Sweek corresponded with the plaintiff, Dr. Davis, in an effort to induce him to join the group having offices in the building. After some correspondence and a personal visit to Phoenix, Dr. Davis agreed to associate himself with the group if he could be guaranteed an annual income of \$12,000 a year for two years. In reply Dr. Sweek telegraphed "My wire should read accept terms your letter answer." The following day Dr. Davis replied "Okay I am delighted" and shortly thereafter moved to Phoenix. During the ensuing year Dr. Davis's income from his practice totaled \$9,400 and he made effort to collect from the corporation the difference between that amount and the sum he understood had been guaranteed him. When the corporation failed to pay the difference he brought suit against it. The trial court gave judgment for Dr. Davis, and the corporation appealed to the Supreme Court of Arizona.

The correspondence between Dr. Sweek and Dr. Davis, said the court, constituted a written contract, yet Dr. Sweek had no authority to bind the corporation by such a contract. As an agent of the corporation he could only bind his principal when acting within the scope of his authority, actual or implied. He had no actual authority to enter into an agreement on behalf of the corporation to guarantee Dr. Davis a specific income and Dr. Davis by reason of his correspondence and his trip to Phoenix should have known that the activities of the corporation were to be confined substantially to the construction of a building suitably equipped where members of the group might maintain their offices, and that it was not the intention of the corporation to conduct a hospital manned by a staff of paid physicians. The Supreme Court pointed out, however, in

denying recovery to Dr. Davis against the corporation, that, "When an agent makes a contract ostensibly on behalf of a disclosed principal, without sufficient authority to do so, it is the agent and not the principal who is liable upon such contract, and in the present case plaintiff's remedy was against Dr. Sweek and not as against the defendant corporation." The judgment for Dr. Davis was reversed.—*Lois Grunow Memorial Clinic v. Davis (Ariz.) 66 P. (2d) 238*

Malpractice Facial Paralysis Attributed to Mastoidectomy—The plaintiff sued the defendant, a physician, alleging that during the course of a mastoidectomy performed on her the defendant severed or injured her left facial nerve, causing a loss of function of that nerve and causing the muscles of the left side of her face to become permanently paralyzed. The jury returned a verdict for the plaintiff but the trial court gave judgment for the defendant. The plaintiff then appealed to the Supreme Court of Wisconsin.

The state of the evidence at the close of the trial, said the Supreme Court, was such as to require a directed verdict in the defendant's favor. According to the evidence, infection, thrombosis, and injury to the facial nerve in an operation are among the causes of facial paralysis. The plaintiff sought to show that a certain one of these several possible causes was more probable than either of the others as the cause of her difficulty. Her case rested on an assumption that there was a complete paralysis of the left side of her face immediately following the operation and on the claim that the defendant, in effect, admitted ignoring the location of the nerve during the mastoidectomy. The testimony of the defendant, called as a witness by the plaintiff, was that, if there was an immediate facial paralysis, an injury during the operative procedure was a more probable cause of the paralysis than thrombosis or infection. But, the court said, an examination of the evidence bearing on the existence or nonexistence of signs of paralysis fails to show that there was an immediate onset of paralysis or anything other than that the disturbance of the facial nerve proceeded in such a way that it might have been caused by thrombosis or infection or both. All the expert witnesses agreed that if the facial nerve was injured instrumentally the facial paralysis would ensue suddenly and completely. The testimony of the defendant, when called by the plaintiff, was to the effect that the paralysis was not immediate but that it increased during the course of several hours. The operation was completed at 10:13 a. m. Some twenty minutes later, the defendant saw the plaintiff and she then manifested no unusual condition. Some time before noon, an intern noticed that the left side of her mouth was drooping. He telephoned the defendant, who saw her again at noon. He then noticed the drooping of her mouth but testified that her left eye was not then discharging tears. The plaintiff testified that when she got back to her room after the operation she noticed that saliva was coming out of her mouth, that her eye was "running," that there was no feeling in her cheek, that her "taste was terrible," that she was unable to close her left eye, and that she could not control the muscles of her left cheek. In view of the fact that she had been under a general anesthetic, the court said, and from her further testimony as to her recollections of events happening on the day of the operation, it cannot be said that her testimony is evidence of her facial condition during the day. She testified that she could not recall very distinctly what occurred when she got back from the operating room, that she knew her mother and sister were there and that in the evening the rest of the family was there, but she did not remember anything that went on that day. She did not recall whether the defendant was or was not there and she could remember nothing that the nurses said to her. The evidence, the court concluded, fell far short of eliminating infection or thrombosis as a cause of the plaintiff's misfortune and quite certainly failed to establish that immediate paralysis of the muscles relied on as a fact by some of the expert witnesses for the plaintiff did occur.

The evidence, the court said, did not warrant an inference that the condition of the plaintiff was traceable to any act of the defendant so as to sustain a finding of the jury to that effect. The evidence offered by the plaintiff left the cause of the injury to speculation and conjecture while the defendant's evidence indicated the exercise by him of the proper degree of

care and skill in the treatment of the plaintiff. Since the evidence did not sustain a finding of negligence, the defendant was entitled to a dismissal of the action. The judgment of the trial court for the defendant was therefore affirmed—*Albert v Gordon (Wis)*, 272 N W 352

Workmen's Compensation Acts Industrial Commission Has Exclusive Jurisdiction over Claim Based on Malpractice—The plaintiff received an injury to his right elbow and the California industrial accident commission ordered weekly payments to be made to him as long as he was disabled. About fourteen months later the employer's insurance company required the workman, as a condition to a continuance of its payments under the award, to submit to an operation to be performed by physicians selected by the insurance company. As a result, it was alleged, of the negligent performance of the operation the plaintiff's injury was aggravated and his disability became permanent. He then instituted an action at law against the insurance company to recover damages for the malpractice of the physicians. A demurrer interposed by the company was sustained and the plaintiff appealed to the district court of appeal, second district, division 2, California.

The sole question before the court was whether or not the plaintiff had a remedy before the industrial accident commission against the insurance company and whether or not such a remedy was exclusive. In *Alaska Packers' Ass'n v Industrial Accident Commission*, 200 Calif 579, 253 P 926, the Supreme Court of California said:

The California Workmen's Compensation Act provides the only means by which an injured employee can recover compensation from his employer for injuries received in the course of and arising out of his employment, and it abrogates the common law liability of the master for such injuries in the cases to which it is applicable. When the specified conditions exist, the remedy provided by the Act is exclusive of all other statutory or common law remedies.

A disability, resulting from treatment instituted to cure or relieve a workman from the effects of a compensable injury, is compensable under the California workmen's compensation act. In the present case, the new or aggravated disability caused by the negligent performance of the operation constituted a part of the disability for which the plaintiff was entitled to an award from the industrial accident commission. The commission, therefore, had exclusive jurisdiction over such claim.

The court held, therefore, that the plaintiff should press his claim before the industrial accident commission, not in a court of law. The judgment of the lower court in effect dismissing the suit was affirmed—*Nelson v Associated Indemnity Corporation (Calif)*, 66 P (2d) 184.

Hospitals Duty of Hospital to Safeguard Patients from Injurious Medical Treatment—The plaintiff sustained personal injuries as a result of a so called "cancer cure" prescribed and administered by defendant Rigley, a layman, under the supervision of the defendant Hodkin, a licensed physician. The treatment was administered to the plaintiff while he was a patient of defendant Hodkin in the Park East Hospital. The plaintiff sued Rigley, Dr Hodkin and the hospital and obtained a judgment for \$40,211.35. From this judgment the hospital appealed to the supreme court of New York, appellate division, second department.

The trial court charged the jury that the hospital owed the plaintiff the duty of exercising reasonable care for his safety and protection and that in determining whether or not it had discharged that duty the jury might consider the fact that no one in authority inspected the plaintiff's hospital record or chart, that the case was not reported to the chief of staff, and that no staff meetings were held with reference to it. The jury was further instructed, in effect, that if the performance of these acts would have led to a discovery of the dangers inherent in the treatment administered, the hospital failed in its duty. In the opinion of the appellate court, the trial court erred in thus instructing the jury. Assuming, the court said, the hospital was under a duty to exercise such care, the scope of this duty did not extend to the professional treatment administered by the plaintiff's own physicians, whether they were licensed or not. The hospital had no right to interfere with that treatment. Furthermore, a hospital, whether charitable

or private, is immune from liability to patients by reason of the negligence of its doctors and nurses with respect to any matter relating to the patient's medical care and attention. The appellate court, therefore, with two of the five justices dissenting, reversed the judgment against the hospital.

The presiding justice, who wrote the dissenting opinion, said that while a hospital is not required to pass on the efficacy of treatment nor may it decide for a physician whether an operation is necessary, or, if one is necessary, the nature thereof, yet it owes to every patient whom it admits the duty of saving him from an illegal operation or false, fraudulent, or fictitious medical treatment. If a physician attached to such an institution performs an operation which he and the hospital administration know is unnecessary, liability would be cast on the hospital. If the hospital knowingly permits the patient to be brought in contact with a contagious disease and he suffers therefrom, the hospital would be responsible. If the hospital knows that a patient is being physically maltreated by doctors, nurses, and others, and makes no effort to stay such misconduct, it would be chargeable. In the present case, defendant Rigley had no license to practice medicine. His alleged cancer cure had no merit whatsoever. On the contrary, it was dangerous to human life. The nurses of the hospital knew the treatment was administered by Rigley and they accepted orders from him. Nurses are not expected to advise the hospital authorities if they think a physician is not using proper methods, for they are under the supervision of the physicians. But here they observed that it was not a doctor who was treating the patient. If the hospital knew, or in the exercise of reasonable care should have known, this "knavery" was going on, and made no effort to stop it, then, in the opinion of the presiding justice, it should be held liable. There was ample proof in the case, aside from the knowledge of the nurses, from which a jury could find that the hospital not only had reason to know, but actually did know, what was going on.

Furthermore, the medical practice act provides, in effect, that in a suit for malpractice the fact that the defendant is unlicensed shall be deemed prima facie evidence of negligence. Here Rigley was not licensed and the hospital knew it, yet permitted him to treat the plaintiff in the hospital. It aided and abetted him in a violation of the medical practice act. Rigley was prima facie negligent because he was not licensed. So was the hospital for aiding him.

In the opinion of the majority of the court, however, the hospital was not liable—*Hendrickson v Hodkin et al (N Y)*, 294 N Y S 982.

Health Insurance Paresis Excuses Failure of Insured to Give Notice of Disability—A failure on the part of the insured, in the opinion of the Supreme Court of Louisiana, to notify the insurer of his disability prior to default in the payment of premium, as required by the policy, will not defeat recovery on the policy if the insured's disability and his failure to give the notice was due to paresis—*Hickman v Pan American Life Ins Co (La)*, 173 So 742.

Society Proceedings

COMING MEETINGS

American Academy of Orthopedic Surgeons Los Angeles Jan 16-20
Dr Carl E Badgley 1313 East Ann St Ann Arbor Mich Secretary
American Orthopsychiatric Association Chicago Feb 24-26 Dr Norville C La Mar 210 East 68th St New York Secretary
Annual Congress on Medical Education and Licensure Chicago Feb 14-15 Dr W D Cutter 535 North Dearborn St Chicago Secretary
Eastern Section American Laryngological Rhinological and Otological Society Philadelphia Jan 7 Dr Louis H Clerf 1530 Locust St Philadelphia Chairman
Middle Section American Laryngological Rhinological and Otological Society St Louis Jan 26 Dr James B Costen Beaumont Bldg St Louis Chairman
Pacific Coast Surgical Association Los Angeles Feb 22-25 Dr H Glenn Bell University of California Hospital San Francisco Secretary
Southern Section American Laryngological Rhinological and Otological Society Atlanta Ga Jan 24 Dr Murdock S Eguen 144 Ponce de Leon Ave N E Atlanta Ga Chairman
Western Section American Laryngological Rhinological and Otological Society Santa Barbara Calif Jan 29-30 Dr Arthur C Jones, East man Bldg Boise Idaho Chairman

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama Medical Association Journal, Montgomery

7 181 208 (Nov.) 1937

- Diagnosis and Management of Colon Lesions D C Donald Birmingham—p 181
Disease of Cardiovascular System as an Industrial Hazard J O Finney Gadsden—p 185
Multiple Neuritis R O Russell, Birmingham—p 187
Out of the Ordinary C Thorington Montgomery—p 190
Sulfanilamide J N Baker Montgomery—p 192

American J Obstetrics and Gynecology, St Louis

34 731 910 (Nov.) 1937

- Story of Prenatal Care Presidential Address T J Taussig St Louis—p 731
Sarcoma of Uterus Clinical and Pathologic Study of Fifty Nine Cases E Novak Baltimore and D F Anderson Glasgow Scotland—p 740
Clinical Significance of Endometrial Hyperplasia F L Payne Philadelphia—p 762
Observations Pertinent to Gonadotropic Therapy in Gynecology R A Ross Durham N C—p 780
Study of Hormone Content of Ovarian Cyst Fluids F L Adair and Ruth M Watts Chicago—p 799
*Efficient Composite Operation for Uterine Prolapse and Associated Pathology E H Richardson Baltimore—p 814
Prolapse of Uterus Shifting Trends in Treatment J L Baer R A Reis and R M Laemie Chicago—p 827
Unusual Obstetric Injury Causing Detachment of Bladder and Urethra from Symphysis Pubis and Complete Epispadias G L Hunner Baltimore—p 840
*Biologic and Clinical Import of Vulvovaginal Mycoses H C Hessel tine Chicago—p 855
Analgesia and Anesthesia and Their Bearing on the Problem of Short ened Labor A H Bill Cleveland—p 868
Conservative Treatment of Premature Separation of Normally Implanted Placenta F C Irving Boston—p 881
Ethiology of Congenital Malformations in Light of Biologic Statistics D P Murphy Philadelphia—p 890
Continuous Auscultation of Fetal Heart by Means of an Amplifying Stethoscope Preliminary Report H B Matthews Brooklyn—p 898

Operation for Uterine Prolapse—Richardson endeavored to devise a composite operative plan that would combine the essential features of total vaginal hysterectomy with those of the several transposition methods. The composite operation avoids the objections to the commonly used procedures. By utilization of the time honored high amputation of the cervix coupled with subtotal vaginal hysterectomy, it eliminates existing and potential uterine disease, thereby also relieving the supporting structures of considerable dead weight, by preserving intact that segment of the cervix to which are normally attached the cardinal and the uterosacral ligaments together with the sturdy pubocervical fascia, ideal conditions are created for adaptation of the most dependable features of the several transportation operations, plication of the vesical sphincter is easily executed; accurate identification and dissection of the pubocervical fascia permits imbrication of this valuable unit beneath the neck of the bladder and urethra in accordance with the established principles of hernioplasty, suture of the round ligaments into the angles of the cervical stump provides additional lift and support, adequate circulation to the cervical stump and attached structures is assured through preservation of the adjacent main trunks of the uterine vessels and their branches, the ureters are not endangered by any step of the operation, obliteration of the culdesac and plication of the uterosacral ligaments for associated enterocele are readily effected, and reinforcement of the rectovaginal fascia together with reconstruction of the pelvic floor and perineum completes the operation, with accurate restoration of normal anatomic relationships having been achieved. Every important step of

the operation is borrowed from an already well established procedure in the treatment of vaginal hernias. Immediate results in twenty-five cases have been completely satisfactory.

Import of Vulvovaginal Mycoses—Hesseltine reviews some of the recent contributions to monilial and cryptococcic vulvovaginal mycosis. He emphasizes that the term "diabetic vulvitis" is incorrect, since it is apparently a mycotic infection, and suggests that "mycotic vulvitis" or "fungous vulvitis" be used instead. Dextrose as such does not cause irritation but produces a more favorable medium for *Monilia* and *Cryptococci*. Every patient with mycotic vulvitis should be examined for diabetes mellitus, and every diabetic patient with vulval symptoms should be examined for mycotic infection. The similarity of certain stages of mycotic vulvitis to kraurosis is mentioned. It is suggested that the fungi produce the precipitating factor extrinsically for the tissue reaction, while in such diseases as kraurosis it may possibly be liberated intrinsically. When the patients can receive vulvovaginal topical application from three to six times a week, good results are obtained by using 1 or 2 per cent aqueous gentian violet solution as recommended by Plass and others. Patients of the Chicago Lying-in Clinic object to such alcoholic concentration and often are unable to make frequent trips for local treatment. Iodine liberated from potassium iodide and potassium iodate is a potent fungicide. *In vivo* the vaginal acids are used to complete the reaction. To carry each mole of iodine freed, a mole of potassium iodide is necessary. Thus 8 moles instead of 5 of potassium iodide to one of potassium iodate is the correct ratio. Since this chemical reaction in solution is sudden and iodine is prone to burn, this mixture is diluted with neutral kaolin and dispensed in gelatin capsules. To guard against the premature liberation of iodine by acid impurities with the kaolin, this diluent is treated with ammonia and then dried to remove the excess. Capsules of 00 or 000 size contain approximately 0.125 Gm of the potassium iodide-potassium iodate mixture. The bulk of the content is kaolin. This allows for gradual solution and thus a gradual liberation of iodine over a longer period. Better results than with weekly or semiweekly application of gentian violet have been obtained by painting the vagina with diluted compound solution of iodine (using the strongest concentration the patient can tolerate without discomfort, usually one-fourth strength) once a week, and the patient inserting two of the capsules in the vagina each night. Generally patients can be cured within a period of several days or a few weeks. The results have been about the same for the pregnant and the nonpregnant patient.

American Journal of Ophthalmology, St Louis

20 1087 1188 (Nov.) 1937

- *Laboratory Study of Some Antiseptics with Reference to Ocular Application R Thompson M L Isaacs and Deborah Khorazo New York—p 1087
Etiologic Study of Series of Optic Neuropathies J I Moore Baltimore—p 1099
Studies on Galactose Cataract J G Bellows and L Rosner, Chicago—p 1109
Production and Cure of Ocular Disturbances in Adult Albino Rats by Adjustment of Vitamin A Clinical Implications A M Yudkin, Aline U Orten and A H Smith New Haven Conn—p 1115
Neuromyelitis Optica F B Frailek and R N DeJong Ann Arbor, Mich—p 1119
The X-Ray Therapy of Retinal Vein Thrombosis H S Gradle Chicago—p 1125
The Eye in Neurology G R Kamman St Paul—p 1132
Osteitis Deformans with Pigmented Corneal Degeneration Second Case on Record R von der Heydt Chicago—p 1139
Photographic Analysis of Alternating Vision During Reading B Clark San Jose Calif—p 1142

Study of Ocular Antiseptics—Thompson and his colleagues studied the antiseptic value of alba, iodine, mercuriochrome, acriflavine, chloramine-T, gentian violet, phenyl mercuric nitrate, mild protein silver, merthiolate and silver nitrate. They kept in mind the following: the disinfectant rate, under conditions simulating as closely as possible those which occur in human tears, of the highest concentrations nonirritating to the conjunctiva, the influence of increased protein concentration on the disinfectant rate, the influence of dilution of the antiseptic on the disinfectant rate, and the toxicity of the antiseptic for leukocytes and for lysozyme. They are not yet in a position to say that one substance is superior to another, that a marked disinfectant action is or

is not counterbalanced by an extreme toxicity for leukocytes. The circumstances under which the agent is to be used would alter the weight given to the various properties. With repeated application in the case of an infection it is likely that leukocytic injury would be more detrimental than in removing organisms from the membrane with one application previous to operation.

American Journal of Public Health, New York

27 1079 1206 (Nov.) 1937

- Public Health the Basic Factor of Social Security A T McCormack Louisville, Ky.—p 1079
- The Health Department in the Field of Medicine From the Standpoint of Experience in England A Newsholme Worthington Sussex, England—p 1089
- Sanitation and Quality Control in the Fishery Industries G A Fitzgerald and W S Conway Jr Boston—p 1094
- International Cooperation in Hygiene F G Boudreau New York—p 1102
- Relationship of the Diet to the Self Regulatory Defense Mechanism II Lysozyme in Vitamin A and in Uronic Acid Deficiencies N P Sullivan and I A Manville Portland Ore.—p 1108
- Results of Mass Education for Tuberculosis Prevention in Detroit H F Vaughan G E Harmon and J G Molner Detroit—p 1116
- Education in Nutrition by Private Agencies J A Tobey, Chicago and New York—p 1124
- Virus Diseases and the Public Health W A Sawyer New York—p 1129
- Production and Use of Smallpox Vaccine Virus Cultivated in Chorio Allantoic Membrane of Chick Embryos G J Buddingh Nashville Tenn.—p 1135
- Etiologic and Serologic Studies in Epidemic Influenza T Francis Jr, T P Magill E R Rickard, New York and M Dorothy Beck San Francisco—p 1141
- Nature of Virus Agents H Zinsser Boston—p 1160

Anatomical Record, Philadelphia

69 261 388 (Oct.) 1937

- Thyroid Stimulating and Gonadotropic Hormones of Human Anterior Pituitary Gland at Different Ages and in Pregnant and Lactating Women J Saxton and L Loeb St Louis—p 261
- Rate of Uterine Growth Resulting from Chronic Distention S R M Reynolds and S Kaminester Brooklyn—p 281
- Occurrence of Arteriovenous Anastomoses in Tongue of Dog Margaret E Brown Ithaca New York—p 287
- Distribution of Aortic Nerve Fibers and Epithelioid Bodies (Supracardial Paraganglions) in the Dog J F Nonidez New York—p 299
- Relation of Kidney Weight to Body Weight in the Cat V E Hall and W W MacGregor Stanford University Calif—p 319
- Rapid Method of Preparing Ground Tooth Sections G Bevelander New York—p 333
- Fat Distribution in Mitochondria of the Guinea Pig Liver R R Bensley Chicago—p 341
- Cultivation of Adult Rabbit Testicle in Roller Tubes W Mendelsohn Baltimore—p 355
- Vascular Supply of Hypophysis Cerebri of the Cat G B Wislocki Boston—p 361

Archives of Ophthalmology, Chicago

18 697 886 (Nov.) 1937

- Fatty Degeneration of the Cornea (Neutral and Lipoid) R E Wright Madras India—p 697
- Herpes Zoster Ophthalmicus Complicated by Ophthalmoplegia and Exophthalmos R F Carmody Gary, Ind.—p 707
- Glaucoma at the Wills Hospital 1926 1935 L Lehrfeld and J Reber Philadelphia—p 712
- Accommodation and Autonomic Nervous System D G Cogan Boston—p 739
- Bilateral Atrophy of Optic Nerve in Periarteritis Nodosa Microscopic Study I Goldstein and D Wexler New York—p 767
- Fitting of Prostheses for Patients with Cryptophthalmos and Extreme Microphthalmos P Gougelman Chicago—p 774
- *An Unclassified Type of Optic Neuritis Report of Cases G E Clay and J M Baird Atlanta Ga.—p 777
- Human Factor in Airplane Crashes C E Ferree and G Rand Baltimore—p 789
- Near Reaction of the Pupil in the Dark Quantitative Study F H Haessler Milwaukee—p 796
- Equal Advancement and Recession Operation for Horizontal Strabismus R J Curdy Kansas City Mo.—p 802
- Chemistry of the Retina IV The Bacillary Layer A C Krause Chicago—p 807
- Chronic Edema of Cornea Report of Case J M Levitt Brooklyn—p 813
- Instrument for Qualitative Study of Dark Adaptation J B Feldman Philadelphia—p 821
- Surgical Intervention for Cataract from the Preoperative and Postoperative Standpoints C A Clapp Baltimore—p 827

Unclassified Type of Optic Neuritis—In the last nine months Clay and Baird encountered seven cases in which the optic disks presented a swelling varying from 1 to 6 diopters. In all there was sudden loss of vision with central scotomas, and in two there was no perception of light. In one case, in

which the first examination was made in 1931, a diagnosis of optic neuritis of unknown cause was made. The patient returned in February 1937 showing advanced consecutive atrophy but vision of 20/30 in each eye. Another patient, who had sudden temporary loss of vision in 1932, showed atrophy of the papulomacular bundle, with vision of 20/200 in each eye in 1937, when first seen. The onset in the other five patients has occurred during the past nine months. Five additional cases of optic neuritis of undetermined cause have been observed in Atlanta by others. The ages of the patients varied from 5 to 22 years. In most instances a prodrome of malaise, slight cold and sore throat antedated the onset from one to two months. Characteristic also were soreness and pain on movement of the eyeballs. Atrophy of the optic nerve occurred early and was consecutive in type (postneuritic), its severity varied with the duration of the swelling. If vision failed to show improvement early, i. e., in six weeks, the prognosis was grave. Review of the American literature for the past decade has failed to show any specific classification of these cases. In a study of forty-three cases, of true optic neuritis seen in private practice since 1932, none were found that could be placed in this group. In these seven cases there was no history of familial disease or of sinus infection, otitis media or trauma. The authors feel that the condition in these seven cases warrants a new classification, namely, acute infectious optic neuritis, the cause being an unknown virus with predilection for the optic nerve.

Archives of Otolaryngology, Chicago

26 509 648 (Nov.) 1937

- *Use of Urea in Treatment of Chronic Otitis Media Preliminary Report P S Mertins Jr Montgomery Ala.—p 509
- Measuring the Sensation of Loudness New Approach to Physiology of Hearing and Functional and Differential Diagnostic Tests E P Fowler New York—p 514
- *Treatment of Chronic Purulent Otitis Media R Harris Jackson Miss.—p 522
- Simple Technique for Taking Motion Pictures of Larynx in Action J J Pressman and A Hinman Los Angeles—p 526
- Salivary Calculus Containing a Foreign Body Report of Case J A Pilcher Jr Roanoke Va.—p 531
- Intradural Conditions in Relation to Rhinology and Otolaryngology Critical Survey of Recent Literature W P Eagleton, Newark N J—p 534
- Chronic Progressive Deafness Including Otosclerosis and Diseases of the Inner Ear G E Shambaugh Jr Chicago—p 583

Urea in Treatment of Chronic Otitis Media—Mertins has never found that urea harms the delicate epithelium of a radical mastoidectomy cavity and he has used it on exposed dura without signs of irritation or toxicity. Occasionally on acutely inflamed or raw tissue there is some pain, but this is seldom comparable with that produced by alcoholic solutions. He also observed its effect on a number of patients with chronic disease of the ear and was more than pleased with the results. Patients who underwent radical mastoidectomy have been treated in a similar manner, with equally pleasing results. It has almost eliminated the necessity of daily packing, punching and scraping. The treatment has also been tried on several patients who came in for cleaning of radical mastoidectomy cavities and it was found that a week's use of a solution of urea cleaned out almost all debris, leaving the skin pink and healthy. In chronically infected middle ears in which the saturated solution could be brought in contact with the diseased area satisfactory results, with few exceptions, have been obtained. Eleven other persons with chronic otitis media with large perforations were treated by dropping a saturated solution of urea in the ear twice daily. The odor was rapidly eradicated, and all the ears are dry and clean at the time of writing. One had been treated several times by ionization, without success, and many had had several different courses of treatment, with only temporary relief at best. To avoid complicating the results the author has used urea alone satisfactorily, although he sees no reason why it should not be combined with any form of therapy which the individual physician might favor or the variation of the condition warrant with even greater success. Indeed, the work of Holder and MacKay on various combinations of urea with other forms of therapy is of interest and will undoubtedly be of value in selected cases of aural disease. The solution is applied with a dropper twice daily, beginning with small amounts and

increasing rapidly if there is no pain. The crystals may be applied directly or with a powder blower, care being taken to remedy any caking either in the canal or in the powder blower. A small amount of water or saline solution will usually correct this. In a few cases there will be some pain at first. Neighboring pathologic processes or factors in the general health of the patient, which often assume a dominating role in prolonging infection anywhere, should not be overlooked, for urea therapy is not a cure-all or a new magic healing power, the results being due simply to a more adequate removal of the gross and microscopic debris in the recesses of the middle ear, giving nature a fair chance, often with surprisingly successful results.

Treatment of Chronic Purulent Otitis Media—Harris has used the powdered extract of *Carica papaya* in chronically suppurating ears with satisfactory results. A solution is made the moment before it is instilled into the ear, while the patient is prone, it is allowed to remain for a few seconds and then the ear is wiped dry. The solution penetrates to the far crannies better than powder. This vegetable digestant cleans the surface of visible pathologic tissue and after a few treatments, in the ordinary case, leaves a dry ear. The solution may be injected into the eustachian tube, and the results in empyema of the eustachian tube have been surprising.

Archives of Surgery, Chicago

35 833 1030 (Nov.) 1937

- Influence of Venous Stasis on Production of Chronic Arthritis P E McMaster Los Angeles—p 833
Fibroblastic Tumor of Extremities E M Beck New York—p 841
Experimental Giant Cell Tumor and Cartilaginous Exostosis of Bone J D Bisgard Omaha—p 854
Cavernous Hemangioma of Spleen Report of Case and Review of Literature L E Schottenfeld and W L Wolfson Brooklyn—p 867
Experimental Subtotal Ligation of Arteries Supplying Liver C Huggins and J Post Chicago—p 878
*Lymphoid Hyperplasia of Appendix with Note on Its Role in Acute Appendicitis S H Gray and C J Heifetz St Louis—p 887
Adrenal Cortex Cytologic Study of Normal and of Pathologic Tissue E L Strohl Rochester Minn—p 901
*Myeloma and Its Neural Complications C Davison and B H Balser New York—p 913
Experimental Production of Goiter H R Mahorner New Orleans—p 937
Congenital Dislocation of Shoulder and Other Anomalies Report of Case and Review of Literature L Cozen San Francisco—p 956
Hyperplasia and Neoplasia of Interstitial Cells of Testicle E E Jemerin New York—p 967
Review of Urologic Surgery A J Scholl Los Angeles F Hinman San Francisco A von Lichtenberg Budapest Hungary A B Hepler Seattle R Gutierrez New York G J Thompson J T Priestley Rochester Minn and V J O'Connor Chicago—p 999

Lymphoid Hyperplasia of the Appendix—In the routine examination of appendices removed at operation, Gray and Heifetz were impressed by the unusual richness of the lymphoid tissue as the prominent histologic feature in a group of cases presenting the clinical syndrome of a mildly acute, subacute or recurrent appendicitis. Their studies led them to believe that hyperplasia of lymphoid tissue, either focally or diffusely, may cause sufficient obstruction in the narrow-lumened appendix to produce symptoms simulating appendicitis. Furthermore, in reviewing a series of cases of pathologically early acute appendicitis they felt that here too the hyperplasia of the lymphoid tissue might be a factor of prime etiologic importance. In the years 1926 to 1933 inclusive there were approximately 14,000 appendectomies performed at the Jewish Hospital. The records of all these cases were examined and fifty-one were observed in which a definite diagnosis of lymphoid hyperplasia of the appendix could be made. The clinical symptoms presented by these patients simulated those of mild acute appendicitis. The clinical picture is explained on the basis of an obstruction by hyperplasia of lymphoid follicles in a narrow-lumened organ, occurring during a period of life when the lymphoid tissue is normally richest.

Myeloma and Its Neural Complications—Davison and Balser point out that, among 20,000 patients admitted to the Montefiore Hospital, twelve had myeloma. Of this group, 6,500 came to necropsy, and myeloma was found in nine instances. The brain and spinal cord were examined in six of these cases. Neurologic signs and symptoms secondary to cranial or vertebral involvement were noted in all twelve cases. There was direct metastasis to the spinal dura in one, involve-

ment of the peripheral nerves in another and the presence of a psychosis in a third instance. In the six necropsies the spinal cord, roots, peripheral nerves or brain were involved. In most of the patients with lesions of the spinal cord the neurologic symptoms were produced by compression of the vessels of the spinal cord. A myelopathic process resulted from interference with the circulation. The damage to the fiber tracts depended on the degree and duration of the compression. In case 1 there was a direct metastasis to the spinal dura. The herpes zoster noted in a number of these cases was caused by the direct compression of the spinal roots by the neoplasm. In case 6 the peripheral neuritis may have been due to compression of the brachial plexus, severe anemia or unknown toxic factors. In case 5 the myelomatous nodules of the cerebral dura and skull resulted in interference with the cerebral circulation and the production of a paranoid psychosis.

Canadian Public Health Journal, Montreal

28 471 522 (Oct.) 1937

- Full Time Rural Health Service J A Ferrell New York—p 471
The Control of Lobar Pneumonia F L Horsfall Jr, New York—p 476
The Venereal Disease Problem in Canada G Bates Toronto—p 485
*Zinc Sulfate as a Chemoprophylactic Agent in Epidemic Poliomyelitis New Technic for Application to Olfactory Area R S Pentecost Toronto—p 493
Preventive Pediatrics as Seen by the School Medical Officer L P MacHaffie Ottawa Ont—p 498

Zinc Sulfate in Prophylaxis of Epidemic Poliomyelitis

—After experiments, Pentecost found that only with the patient in the following position was there assurance that the olfactory area is covered in its entirety. The patient is placed in a dorsal recumbent position with the head fully extended, 0.5 cc of solution of zinc sulfate is introduced by means of a syringe and small cannula. The tip of the latter is carefully placed directly on the cribriform plate. The catheters used by the author were the radiopaque ureteral catheters. He suggests that catheters of a similar size be specially manufactured for this purpose with one eye at the tip and impregnated with metallic particles sufficient to make them stiff enough for rapid introduction yet sufficiently flexible to avoid injury to the nasal structures. The nasal mucous membranes are partially anesthetized and shrunk by spraying the nose, five minutes before the zinc sulfate is sprayed, with an ordinary atomizer containing 0.25 per cent of pontocaine and 0.25 per cent of ephedrine solution. The patient is placed in the dorsal recumbent position with the head extended so that a line drawn from the external auditory meatus to the chin is in a vertical plane. The syringe is filled with 0.5 cc of the solution and attached to the catheter by means of a ureteral catheter adapter. The olive tip of the catheter is inserted between the upper third of the middle turbinate and the nasal septum for a distance of about half an inch. The solution is thus expelled directly on the olfactory area. The head is maintained in the extended position for about one minute. The patient is then raised to a sitting position and requested to snuff up the nose and expectorate the surplus solution. Anosmia followed immediately after the injection in 100 per cent of cases and persisted for at least five days. Headache followed in every case and persisted for from two to six hours, it was more severe in patients more than 12 years of age.

Delaware State Medical Journal, Wilmington

9 191 206 (Oct.) 1937

- Some Aspects of Medicine of Today C P White Wilmington—p 191
The Future of Medicine H W Blakeslee New York—p 194

9 207 222 (Nov.) 1937

- Heart Disease and Pregnancy with Especial Reference to Maternal Deaths from Cardiac Disease P F Williams Philadelphia—p 207

Florida Medical Association Journal, Jacksonville

24 247 304 (Nov.) 1937

- Use and Abuse of X-Rays in Treatment of Skin Diseases W M Sams, Miami—p 261
Hypothyroidism N M Marr St Petersburg—p 267
Early Pregnancies Observations on Vague Abdominal Pains W W Jones Dade City—p 270
Physical Examinations in Railway Medicine A A Lockwood St Augustine—p 271

Georgia Medical Association Journal, Atlanta

26 485 526 (Oct.) 1937

- Heart Disease and Heart Failure The Modern Problem of Late Middle Life J H J Upham Columbus Ohio—p 485
 Protamine Zinc Insulin in Treatment of Diabetes Mellitus W R Minnich and J E Paullin Atlanta—p 489
 The Split Skin Graft W G Hamm Atlanta—p 495
 *Concerning Primary and Secondary Malignant Tumors of the Choroid F P Calhoun and A V Hallum Atlanta—p 501
 X Ray Therapy in Carcinoma of the Breast T Harrold Macon—p 506
 The Use of Drugs in Treatment of Prophylaxis of Malaria R A Hill Thomasville—p 512
 Practice of Medicine by Corporations G Middlebrooks Atlanta—p 517

Malignant Tumors of the Choroid—Calhoun and Hallum report two cases of malignant tumors of the choroid, one of sarcoma and one of carcinoma. Sarcoma is usually a primary lesion and carcinoma a secondary lesion. In sarcoma of the choroid the earliest possible diagnosis and enucleation of the globe offer the patient the best possible chance against metastasis. One should not hesitate to advise the removal of an eye with a retinal detachment in which a tumor is suspected, for nothing is lost but a blind eye. Postoperative irradiation to the socket of the eye offers some prevention to metastasis. Carcinoma of the choroid is definite evidence of present or impending widespread dissemination from the primary tumor.

Journal of Bacteriology, Baltimore

34 353 460 (Oct.) 1937

- Serologic Classification of Gonococci by Comparative Agglutination W A Casper New York—p 353
 Beta Alanine as a Growth Accessory for Diphtheria Bacillus J H Mueller and S Cohen Boston—p 381
 Variability in Morphologic and Biochemical Properties of Clostridium Histolyticum (Weinberg and Seguin) J C Hoogerheide, Philadelphia—p 387
 Some Serologic Aspects of SR Change in Clostridium Histolyticum L Smith Philadelphia—p 409
 Studies on Anaerobic Bacteria XII Fermentation Products of Clostridium Thermosaccharolyticum N O Sjolander Madison, Wis.—p 419
 Nicotinic Acid as a Growth Accessory Substance for Diphtheria Bacillus J H Mueller Boston—p 429
 Reductive Processes of Clostridium Butylicum and Mechanism of Formation of Isopropyl Alcohol A F Langlykke W H Peterson and E B Fred Madison Wis.—p 443
 A New Culture Medium for Rhizobia W A Albrecht and T M McCalla, Columbia, Mo.—p 455

Journal-Lancet, Minneapolis

57 475 514 (Nov.) 1937

- The Sanatorium Care of Tuberculosis in South Dakota J V Sherwood Sanator S D—p 475
 Vital Capacity Determinations in Health Examinations R G Hinckley Minneapolis—p 478
 The Management of Nephritis W H Long Fargo N D—p 481
 Acute Abdominal Disease C F Dixon Rochester Minn—p 483
 Initial Care and Treatment of Accidental Injuries R H Waldschmidt Bismarck N D—p 486
 Acute Suppurative Mediastinitis Report of Case Also Showing Pulmonary Abscess C E Lyght Northfield Minn—p 489
 When Surgery Is Indicated in Pulmonary Tuberculosis T J Kinsella Minneapolis—p 495
 College Mental Hygiene H C Schumacher Cleveland—p 503

Journal of Nervous and Mental Disease, New York

86 513 644 (Nov.) 1937

- History of Psychiatry and Mental Hospitals in Mexico S Ramirez Moreno Mexico City Mexico—p 513
 Rorschach Inkblot Method in Organic Disturbances of the Central Nervous System Z Piotrowski New York—p 525
 Psychodynamics of Chronic Alcoholism R P Knight Topeka Kan—p 538
 Rosenthal Fibers in Non Neoplastic Syringomyelia Note on Pathogenesis of Syringomyelia A F Liber and J R Lisa New York—p 549
 *Effect of Ergotamine Tartrate in Idiopathic Epilepsy A E Loscalzo New York—p 559

Effect of Ergotamine Tartrate in Epilepsy—In a study to determine the effectiveness of ergotamine tartrate in epilepsy, Loscalzo observed twenty-three patients who suffered from true epilepsy of unknown etiology or so-called idiopathic epilepsy. A clinical, medical and neurologic examination was obtained on every patient. Each patient was asked to return to the clinic once a week for the first few weeks and then every second week. Each patient was asked to note on a piece of paper the date, time and number of convulsions and any other untoward symptoms that might be experienced. At each visit to the clinic these facts were recorded and further his-

tories taken and physical examinations were made when indicated. The average duration of the epilepsy in all cases was 78 years. Depending on the severity and frequency of the attacks, from 2 to 3 mg of ergotamine tartrate was taken orally by each patient daily. The female patients took it without interruption during the menses and without any ill effects. A study of the twenty-three cases shows that continuous oral dosage with ergotamine is ineffective in preventing or controlling the frequency or severity of epileptic convulsions. A mathematical comparison of the average frequency of attacks with previous medication to the number of attacks during ergotamine administration discloses that the number of attacks in the ergotamine treated cases increased by about 45 per cent. This increase, however, was due in all probability to the withdrawal of the sedatives that the patients were taking previous to ergotamine medication rather than to any effect from the ergotamine. It would be interesting to observe the action of ergotamine given by injection just previous to an epileptic seizure.

Journal of Pediatrics, St Louis

11 607 742 (Nov.) 1937

- Study of the Anemic Child H W Josephs Baltimore—p 607
 Incidence of Heart Disease in Cases of Sydenham Chorea P L Parrish L M Taran and S Starr Brooklyn—p 617
 Seasonal Variations in Capillary Resistance of Institution Children Lydia J Roberts Ruth Blair and Marian Bailey, Chicago—p 626
 *Treatment of Acute Poliomyelitis by Intravenous Injection of Hypotonic Salt Solution G M Retan Syracuse N Y—p 647
 Endemic Typhus Fever (Brill's Disease) in a Three and One-Half Year Old Child Case M Caplan and S F DeRosa Meriden Conn—p 665
 The Mantoux Test Statistical Clinical and Roentgenologic Survey of 6 155 Infants and Children Over a Period of Nine Years L A Scheuer and J R Karel New York—p 670
 Central Nervous System Diseases in the Course of Scarlet Fever J H Top Detroit and J E Gordon Jasi Rumania—p 677
 Etiology and Treatment of Enuresis J W Evans Denver—p 683
 Trichohezoar J Schwartzman New York—p 691
 Some Suggestions for Approaching Children and Their Parents Part I E L Vincent Detroit—p 697

Treatment of Acute Poliomyelitis—Retan maintains that acute poliomyelitis can be influenced favorably by the intravenous injection of hypotonic solution of sodium chloride. The statement is based on the following experience. Ten patients with respiratory paralysis have been treated, and all recovered. Improvement in respiratory function is both objective and subjective and occurs during the actual period of treatment. One of the patients showed complete paralysis of both diaphragms and intercostals before treatment. Six patients with paralysis of deglutition recovered promptly. All patients so treated have been able to drink fluids following the first treatment, an event which cannot be explained on a basis of coincidence, as paralysis of the throat does not thus improve in untreated cases. This treatment will not prevent the development of paralysis in every instance. This is particularly true in the ascending (Landry's) type. However, the Landry type of respiratory paralysis from which the patient dies does yield to the treatment, and it is therefore possible to save these patients' lives. More vigorous treatment is indicated in this group. Weakness of the muscles of the extremities, without actual paralysis, has promptly improved and the author has often seen reflexes return following treatment, which have not responded to stimuli before treatment was given. Actual paralysis of the muscles of the extremities does not improve. However, treatment of this group is advised if the case is "active," with the hope of preventing further loss of function. Paralysis and death have been prevented in Rhesus monkeys which have been infected with many times the lethal dose of virus, all the control animals having died after complete skeletal paralysis.

Michigan State Medical Society Journal, Lansing

36 733 804 (Oct.) 1937

- Keep Medicine Free H E Perry Newberry—p 747
 Are Professions Being Commercialized and Mechanized? E W Munshaw Grand Rapids—p 749
 Single Handed Citrated Blood Transfusion Apparatus W B Cooksey Detroit—p 753
 Use of Measurements in Medicine W A Evans Jr Detroit—p 755
 Operative Management of Depressed Fractures Bullet and Other Penetrating Wounds of the Head E S Gurdjian Detroit—p 758
 Maternal Health Aspects of Complications of Pregnancy A M Campbell Grand Rapids—p 763

New England Journal of Medicine, Boston

217 725 764 (Nov 4) 1937

- Examination of the Child with Chronic Pyelonephritis A M Butler and T H Lanman Boston —p 725
 *Causes of Death in Patients with Peptic Ulcer R T Monroe and E S Emery Jr Boston —p 729
 A Note on the Teaching of Obstetrics S Rushmore Boston —p 731
 Progress in Laryngology L A Schall and J R Richardson Boston —p 732

Causes of Death in Patients with Peptic Ulcer — Monroe and Emery reviewed 1,428 cases of peptic ulcer handled in the Peter Bent Brigham Hospital from 1913 to 1932. They were unable to trace 156 patients but are fairly confident that few if any of these have died. Of the remainder, 161 are dead, or 113 per cent of the complete series. But peptic ulcer was the cause of death in only eighty-seven. The mortality was more than twice as high in men as in women and varied with the location of the ulcer: gastric 13.8 per cent, combined gastric and duodenal 11.5 per cent and duodenal 4.1 per cent. Perforation was responsible for nearly one third of the deaths in spite of surgical intervention. Hemorrhage accounted for nearly one fourth, and obstruction for less than 5 per cent. In five cases the exact cause could not be determined, although it was obviously the result of the ulcer. Thirty patients died from surgical complications, the surgical intervention being indicated because of the ulcer. The average age at the time of death for the whole group was 55.9 years. The average duration of symptoms for all cases was 12.4 years, and there was little difference in this respect between the patients who died of their ulcer and those who did not. More patients ultimately died of their ulcers after surgical intervention than after medical treatment. The average age at death was lower after the former treatment than after the latter, but this was probably due to a difference in the severity of the disease. The study suggests that medical treatment should be used for most patients and that surgical intervention should be reserved for specific indications.

New York State Journal of Medicine, New York

37 1795 1890 (Nov 1) 1937

- Uses of Protamine Zinc Insulin W R Campbell Toronto —p 1795
 Irritative Therapy of Schizophrenia: Practical Application and Theoretical Considerations E Friedman Ossining —p 1813
 Combating Syphilis and Gonorrhea The New York City Plan J L Rice New York —p 1822
 Pneumonia: From the Standpoint of Preventive Medicine J H Mebrling Brooklyn —p 1827
 Accidental Smallpox Vaccination and Eczema Vaccinatum G W Graves and Cordelia Dowman New York —p 1835
 A Psychiatrist in a Police Court: Impressions and Experiences R C A Jaenike Rochester —p 1838
 Enterococcal Endocarditis A B Clements New York —p 1842
 Finding Tuberculosis with the Aid of the Private Practitioner: Review of Work of the Mott Haven Consultation Chest Service 1934-1936 H T Pessar and H R Edwards New York —p 1846
 Ileostomy in Fulminating Ulcerative Colitis: Subsequent Closure and Recovery C O Barney and J C M Brust, Syracuse —p 1852

Northwest Medicine, Seattle

36 371 414 (Nov) 1937

- Recent Advances in Treatment of Gonorrhea and Its Complications J G Cheetham and T J Roemer Portland Ore —p 371
 Technic and Dangers of Short Wave Radiotherapy A C Jones Portland Ore —p 377
 *Epilepsy of Allergic Origin N W Clein Seattle —p 378
 Studies in Urinary Excretion and Ascorbic (Cevitamic) Acid E N Todhunter and Eileen Post Pullman Wash —p 381
 Vitamin B₁ and Neuritis K K Sherwood Seattle —p 385
 Multiple Liver Cell Carcinoma (Primary Type): Report of Case C P Larson Tacoma Wash —p 388
 Treatment of Hyperemesis Gravidarum with Water Soluble Extract of Whole Ovary (Agomensin) F B Zener Portland Ore —p 391
 Interpretation of Electrocardiogram with Especial Reference to Coronary Thrombosis R F Foster Seattle —p 394
 Oxygen and Carbon Dioxide Therapy: Basic Principles and Practical Applications G A Dodds and C R Jensen Seattle —p 398

Epilepsy of Allergic Origin —Clein discusses the cases of epilepsy which should be subjected to a painstaking allergic study. The particular criteria necessary to make a diagnosis of allergy, regardless of the symptoms, are: 1 A positive family history of allergy, which is present in practically every case. 2 Previous allergy in the same person, such as eczema, pylorospasm or certain types of gastro-intestinal distress in infancy and, later, urticaria, hay fever, asthma, "chronic nose catarrh" or "sinus trouble," migraine type headaches, canker sores, mucous colitis and vague gastro-intestinal complaints. 3 Pres-

ence of active allergy manifested chiefly by recurrent, frequent colds and chronic coughs. When it has been determined that the patient and his family are at least suggestive of an allergic background, a thorough study, including cutaneous and intradermal tests, is indicated. This is particularly desirable in those cases which have been thoroughly studied for epilepsy and which have not shown improvement. The treatment may require simple elimination of positive foods, a "dust-free" environment, desensitization with a specific antigen or a combination of all. This type of treatment can hope to be effective only in those cases which conform to the general criteria required for the diagnosis of any allergic syndrome. By this endeavor many cases of so-called idiopathic epilepsy might be solved.

Oklahoma State Medical Assn Journal, McAlester

30 391 424 (Nov) 1937

- The Infant and Child as a Urologic Problem E H Fite Muskogee —p 391
 Ocular Muscle Imbalance Following Head Injury D L Edwards Tulsa —p 398
 Cross Cylinder Tests: Their Use at the Trial Case C K Mills McAlester —p 401
 Prolapsed Uteri with Cystocele and Rectocele M E Stout, Oklahoma City —p 404
 The Recognition and Management of the More Common Cardiac Conditions W L Shippey Poteau —p 408

Philippine Islands Med Association Journal, Manila

17 511 592 (Sept) 1937

- Treatment of Malaria G F Austria Balanga —p 511
 Carcinoma of Nose and Nasopharynx with Extension to Cranial Cavity: Case Report with Autopsy Findings A S Fernando and G de Ocampo Manila —p 525
 Is Therapeutic Abortion Legal? P Anzures Manila —p 531
 Different Methods of Removing the Poison from Tuber of Namu (Dioscorea hispida Dennst.) J F Leyva Manila —p 539
 Treatment of Chronic Hypertrophic Rhinitis A R Ubaldo and C D Ayuyao Manila —p 545
 Neonatal Mortality in the City of Manila F Z Cruz Manila —p 549

1~ 593 670 (Oct) 1937

- *Blood Dyscrasia Due to Neosalvarsan: Report of Two Cases W Vitug and J R Cruz Manila —p 593
 Heterophyidiasis VI: Two More Cases of Heart Failure Associated with Presence of Eggs in Sclerosed Valves C M Africa W de Leon and E Y Garcia Manila —p 605
 Hematology in Filipinos II: Normal Mean Corpuscular Volume, Mean Corpuscular Hemoglobin and Mean Corpuscular Hemoglobin Concentration: Various Normal Blood Indexes R J Navarro Manila —p 611
 Termination of Ureterolithotomies J Eduque A T Zavalla and B R Diño Manila —p 621
 Use of Insulin in Hyperinsulinism: Report of Case A Liboro and C J Zalcita Manila —p 629

Blood Dyscrasia Due to Neoarsphenamine —Vitug and Cruz report the cases of two syphilitic women who were subjected to intensive treatment with neoarsphenamine. The first patient developed symptoms of intoxication of the marrow of the bone (anemia, agranulocytosis and purpura). Postmortem studies revealed complete aplasia of the marrow of the bone. The second presented evidences of hypofunction of the marrow of the bone (agranulocytosis, purpura and anemia). Timely abstention from further treatment with neoarsphenamine aided by blood transfusion saved the patient from fatal aplasia of the marrow. Anemia, agranulocytosis or purpura or any combination of the three occurring in treatment with neoarsphenamine, or probably in any other arsphenamine-treated syphilitic patient, is more likely the result of the treatment rather than of the infection. These blood diseases are due to the toxic action of the benzene ring, with its hydroxyl and amino radicals, on the hemopoietic bone marrow, which may be depressed, paralyzed or completely destroyed. In administering neoarsphenamine in a given case of syphilis, the Wassermann test should not be the sole guide. The patient's reaction and his symptoms and signs before and after each injection should be scrutinized closely. Chills and fever, pallor, dizziness, unusual feeling of weakness, headache, nausea or vomiting, pain in the throat, swelling of the gums, and any tendency to hemorrhagic manifestation should be checked by blood counts to guard against serious dysfunction of the marrow. The dosage should be adjusted to each individual patient. It is safer to start with small doses and to work up gradually to the maximum, 0.45 Gm in women and 0.6 Gm in men, varying the frequency of the injection according to the reaction and general condition of the patient.

Tennessee State Medical Assn Journal, Nashville

30 385 424 (Oct) 1937

- Injection Treatment of Hernia N L Higinbotham New York—p 385
- Urology H P Hyde Copperhill—p 390
- Coronary Artery Disease Some Observations on Treatment of Its Acute Episodes with Coramine (Pyridine B Carboxy diethylamide) E R Timmons, Grand Junction—p 391
- Perinephric Abscess with Review of Local Cases E L Rippey, Nashville—p 393
- Gas Gangrene Its Prevention and Treatment B Malone, Memphis—p 402
- Endocrine Disturbances Affecting Menstruation J C Burch Nashville—p 407

30 425 462 (Nov) 1937

- Study of 550 Cases of Chronic Cystic Eroded Cervicitis and Endometrial Hyperplasia Menopausal Menorrhagia E T Newell, Chattanooga—p 425
- Ambulatory Ligation at Saphenofemoral Junction with Retrograde and Supplementary Injections for Varicose Veins W D Haggard and J A Kirtley Jr, Nashville—p 432

Virginia Medical Monthly, Richmond

64 429 486 (Nov) 1937

- Functions of the State Society J M Hutcheson, Richmond—p 429
- Use of Sulfanilamide in Treatment of Gonorrhea Report of Results in 100 Cases F A Reuter Washington D C—p 433
- Sulfanilamide in Treatment of Gonorrheal Urethritis T D Watts, P W Oden and M P Gordon Jr Richmond—p 436
- Petrositis Summary of Experience F D Woodward University—p 439
- Implantation of Endometrial Tissue in Drainage Wound Following Bilateral Salpingectomy Discussion and Case Report W M Brunet and J B Salberg Chicago—p 447
- Therapeutic Considerations of the Requirements for Water H W Bachman Bristol—p 450
- Postoperative Pulmonary Complications H V Hughens Portsmouth—p 452
- *Effects of Tobacco Smoking on Vascular System D G Chapman, Richmond—p 454
- Influenza W P Frazer, Hamilton—p 457
- Ligation of Umbilical Cord by Use of Clamps W McMann Danville—p 459
- Classification and Treatment of Anemias G C Richardson Bristol—p 461
- What Is the Rightful Place of Government in the Organization of Medical Care? W B Porter, Richmond—p 464

Effects of Tobacco Smoking on Vascular System—

Chapman points out that the nicotine and other irritating by-products of tobacco are increased by the amount of moisture in the tobacco, the rapidity of smoking and the tightness of packing. The suction smoke is composed of many ingredients, such as nicotine, pyridine and its derivatives, carbon monoxide, various aldehydes, hydrocyanic acid, methyl alcohol, a volatile oil, and a small amount of arsenic. The local effects of tobacco are manifested by irritation of the mucous membrane of the mouth, nose, larynx and bronchi. In the esophagus, stomach and probably the intestinal tract, there is more or less irritation from swallowed saliva. Very little heat from a cigaret or cigar reaches the mouth if it is smoked slowly and only half is smoked, but if three fourths of a cigaret is smoked rapidly the heat may reach 140 F. There is a definite influence on periodontal circulation. The effect is one of constriction of the capillary walls of the mucous membranes, the flow of blood is slowed and the tissues are not as well nourished. Leukoplakia is produced in many instances by tobacco and does not often improve until smoking is discontinued. The effect of smoking on the gastro-intestinal tract is both local, from the swallowed saliva, and systemic through its effect on the sympathetic nervous system. There are allergic factors also. Observers have stressed the similarity of symptoms produced by smoking and those from duodenal ulcer in young adults. The hunger contractions are inhibited, appetite is dulled, and the gastric secretions and motility are first increased and later depressed. Records have failed to show an increase in the incidence of peptic ulcer in the female with increased smoking. Opinions are now in general accord that tobacco smoking is an exciting factor in thrombo-angitis obliterans, if not an etiologic one, and has a definite bearing on the progress of this disease. Tobacco smoking decreases the blood flow from 57 to 83 per cent, causes a consistent increase in blood pressure averaging between 12 and 15 mm systolic and 10 and 14 mm of mercury diastolic, increases the pulse from 10 to 20 beats per minute and causes an estimated decrease in cutaneous temperature between 0.8 and 1.5 degrees F, being generally lower in the toes than in the fingers. There is a slowing and at

times a complete stoppage of the blood flow in the nail fold capillaries. The physical condition, the nervous, emotional, inherited and acquired neurovascular balance, the time of day, relation to food, the amount of tobacco consumed and the time one has previously smoked, all have a definite bearing on the effects produced. In some persons smoking produces palpitation, breathlessness on slight exertion, precordial or substernal pain and various types of arrhythmias. In persons of the vasospastic type, smoking is distinctly injurious and may permanently affect their health.

Western J Surg, Obst & Gynecology, Portland, Ore

45 581 636 (Nov) 1937

- Tumors of the Parotid Gland and Neck Case Reports D V Trueblood Seattle—p 581
- Some Unusual Lesions of Vertebrae R K Gbormley, Rochester Minn.—p 594
- Treatment of Compression Fractures of the Spine Use of Goldthwait Frame J Dunlop, Pasadena Calif—p 600
- Conservative Treatment of Fracture of the Neck of the Femur O F Ahlin Portland Ore—p 603
- Surgical Treatment of Tuberculosis of Spine in Children S L Haas San Francisco—p 608
- Basic Factors Involved in Proposed Electrical Methods for Measuring Thyroid Function IV Combined Study of Skin and Deep Tissues by the 2, 3 and 4 Electrode Technics A Barnett New York—p 612

Yale Journal of Biopsy and Medicine, New Haven

10 1124 (Oct) 1937

- The Meckel Dynasty in Medical Education R G Meader New Haven Conn—p 1
- Simmonds Disease Report of Case H A Weiner New Haven Conn—p 31
- Concerning Reproduction in the Chimpanzee R M Yerkes and J H Elder New Haven Conn—p 41
- *The Problem of Hypoproteinemia D Melnick and G R Cowgill New Haven Conn—p 49
- Studies on Electrical Potentials of Living Organisms I Base Lines and Strain Differences in Mice C S Marshall and R G Meader, New Haven Conn—p 65
- Response of Chick's Comb to Naturally Occurring Androgens and Estrogens R I Dorfman and W W Greulich New Haven Conn—p 79
- The Cerebellum A Summary of Functional Localization J F Fulton and R S Dow New Haven Conn—p 89

The Problem of Hypoproteinemia—Melnick and Cowgill believe that the approach to the problem of hypoproteinemia lies not so much in the evaluation of dietary factors as in finding a way for stimulating internally the serum protein regenerating mechanism, which seems to involve the capacity of the tissues to furnish protein for the needs of the plasma. Not until the investigator has at his disposal experimental animals exhibiting an impairment in ability to produce serum protein can this problem be studied adequately. At the present time the only approach to the problem is through use of the technic of quantitative plasmapheresis combined with suitable control and evaluation of dietary factors. Three processes compete for the available dietary protein: the repair of wasted tissues, the satisfaction of the normal daily maintenance metabolism and the regeneration of serum protein. It is quite conceivable that any method devised for stimulating internally the serum protein regenerating mechanism in conditions of hypoproteinemia may be effective as a prophylactic measure during pregnancy and lactation. The importance of finding some other method for promoting the formation of serum protein in certain types of nephritis than by feeding relatively high protein diets is to be desired. The degree of proteinuria depends on two factors, the filtration value and the permeability of the glomerular membrane. This carries with it the implication that high protein diets in conditions of Bright's disease may operate through a vicious cycle. Whereas such a diet may eliminate in the patient the incapacitating effects of the edema, it may also, according to Bing, increase glomerular permeability and this may act as one of the major factors in the production of the edema and hypoproteinemia. The present practice of feeding relatively high protein diets in cases of hypoproteinemia, especially when the condition is associated with prolonged loss of protein in the urine, should be looked on merely as a temporary expedient, not only because such a procedure is based on the belief that the proteinuria is solely responsible for the onset and persistence of the hypoproteinemia but also because the consumption of such a ration may possibly operate as part of a vicious cycle and eventually be actually injurious to the patient.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Surgery, Bristol

25 241 478 (Oct.) 1937

- Gallstones and Their Sufferers G Gordon Taylor—p 241
The Movements of the Shoulder Joint. Plea for Use of Plane of the Scapula as the Plane of Reference for Movements Occurring at the Humero-scapular Joint T B Johnston—p 252
Swelling of Upper Limb Following Radical Mastectomy E A Devenish and W H G Jessop—p 261
Retropertitoneal Cyst with Clinical Study of the Subject Case M Hafezi—p 267
Traumatic Rupture of Intralesenteric Diverticula of Jejunum R W Butler—p 277
Use of Erect Position in Cholecystography for Demonstration of Floating Gallstones J F Brailsford—p 280
Lambriundi's Operation for Drop Foot F P Fitzgerald and H J Seddon—p 283
Dermoid and Allied Cysts of the Kidney J C Ross—p 293
*Supervention of Osteogenic Sarcoma in Paget's Disease T B Davie and W E Cooke—p 299
Primary Pleural Cysts A L d Abreu—p 317
Diaphysial Aclasis Showing Sarcomatous Change Two Cases E K Gardner—p 323
Carcinoma of the Cheek. Original Method of Treatment with Reports on Ten Cases N Patterson—p 330
Congenital Arteriovenous Communications. Report of Two Cases J Gilmour and M Bolam—p 337
Rectus Transplantation for Midline Incisional Hernias H C W Nuttall—p 344
*Excision of the Rectum H Devine—p 351
Sarcoma of the Bladder G Y Eggert—p 382
Evolution and Development of Surgical Instruments C J S Thompson—p 388
Gastropoiesis H Stiven—p 395
The Problem of Bleeding Peptic Ulcer G Gordon Taylor—p 403
Surgery of the Sympathetic Nervous System J R Learmonth—p 426

Supervention of Osteogenic Sarcoma in Paget's Disease—Davie and Cooke cite two cases of multicentric foci of osteogenic sarcoma arising in patients suffering from Paget's disease (osteitis deformans). In both cases the development of multiple foci of primary sarcomatous change appears to be undoubted. In each case the appearance of one tumorous mass in association with bone is followed within a comparatively short time by the appearance of tumors in other bones, and in neither case did postmortem examination show any intrapulmonary or other visceral metastases which might suggest that the numerous bony tumors found at necropsy were the result of blood borne dissemination. The second uncommon feature is the apparently benign osteoclastomatous structure of some of the smaller tumors in both cases. While the large frankly sarcomatous tumors partake of the nature of periosteal growths and are attached to, rather than growing in, the bones, the smaller benign-looking tumors are embedded in the bony corticis. The resemblance of these small tumors to the more typical osteoclastomas which not infrequently complicate long standing cases of generalized osteitis fibrosa with hyperparathyroidism is worthy of note, particularly since it is generally accepted that benign giant cell tumors complicate only cases of osteitis fibrosa and never occur in osteitis deformans. The third feature to which attention might be directed is the fact that in each case there appeared to be some abnormal feature of the thyroid and parathyroids in common. This point is of questionable value and may represent nothing beyond the chance association of lesions, but in view of the general feeling that Paget's disease may be associated etiologically with some endocrine disturbance and that the parathyroids may influence growth in general, it seems that particular attention should be drawn to these changes. The conclusions drawn are that Paget's disease predisposes affected bones to sarcomatous changes and that this malignant supervention arises at sites of stress in those bones showing advanced changes of osteitis deformans, possibly as the result of the stimulus of a super-added endocrine disturbance.

Excision of the Rectum—Devine reviews some of the methods of operating on the rectum—methods which depend for their proper performance on the principle of operation on the defunctioned rectum. The conclusions are based on the experience gained from clinical material consisting of about sixty patients on whom rectal resection has been carried out. The preoperative defunctioning and preparation of the rectum and sigmoid make possible rectal operations which had pre-

viously been regarded as impossible (a rectosigmoid anastomosis becomes a reasonably safe operation). By the use of a special operative position (exaggerated lithotomy with a sacral sling) synchronized perineal and abdominal operations can be performed. Operation in the advocated position, and operation on the defunctioned rectum closed at its lower end by a special box clamp, enable a dissection of the rectum to be safely carried out from the perineum toward the abdomen, the dissected segment with all its vessels intact being only abdominally delivered. The method of dissection of the rectum from the perineum to the abdomen—the perineo abdominal method—can be advocated, for it has many advantages (comparative simplicity, lessened operative time, lessened shock, facilitating the simultaneous carrying out of the perineal and the abdominal parts of the operation and enabling the surgeon before the vessels are divided to judge whether a conservative operation can be carried out). The author feels that in the future he may be able not only to select pathologically many more cases favorable for the conservative operation but also to attain more consistent success in carrying out these conservative operations, when they are pathologically and anatomically applicable. There arises no suggestion of a plea for the conservative operation but only the feeling that it is greater surgical art to utilize one's knowledge of carcinoma of the rectum in employing the conservative operation more frequently than has heretofore been the case, in doing it with discretion, and, when employing it, using every artifice of the surgical art to make it more consistently successful.

Journal of Anatomy, London

72 1180 (Oct.) 1937

- Studies on Area Vasculosa of Embryo Chick. II. Influence of Circulation on Diameter of Vessels A F W Hughes—p 1
Relation Between Size of Artery and Capillary Bed in the Embryo H H Woollard and J A Harpman—p 18
Development of Cerebrospinal Fluid Spaces and Choroid Plexuses in the Chick H Cohen and Sarah Davies—p 23
The Nerve Supply of Bone D J Hurrell—p 54
Cultivation of Nerve Cells In Vitro Over a Long Period. Second Note H Meyer and W Jablonski—p 62
Torus Mandibularis in the Bushman M R Drennan—p 66
Suprarenals of the Larger Felidae W C O Hill—p 71
Congenital Urogenital Anomalies in Rats Including Unilateral Renal Agenesis. Further Data in Support of Their Inheritance A M Hain and E M Robertson—p 83
Variations from Normal Gait After Muscle Section in Rabbits D Stewart—p 101
Development of Penile Urethra and Homology of Cowper's Gland of Male Sperophil (Citellus tridecemlineatus), with Note on Prostatic Utricle M A H Siddiqui—p 109
Simple Apparatus for Stimulating Human Nerves V T Inman and R C Combs—p 116
Subcutaneous Veins of the Neck Ellen Pickleff—p 119
Valved Transverse Septum in the Femoral Vein A G Gibson and K J Franklin—p 128

Lancet, London

2 949 1004 (Oct. 23) 1937

- The Time Has Come A Hurst—p 949
The Pathogenesis of Multiple Aneurysms S Nevin and D Williams—p 955
Examination of Bone Marrow by Sternal Puncture A F Zanaty—p 958
*Merthiolate in Treatment of Tuberculosis S L Cummins—p 962

Merthiolate in Treatment of Tuberculosis—Cummins used a freshly prepared 1 per cent solution of merthiolate in the treatment of fifteen patients having pulmonary tuberculosis who had received no specific treatment previously. The directions were that the following doses were to be given intravenously every second day so that the course should last a fortnight 2, 3, 4 and 5 cc for each of the final four doses. The urine was tested every day for albumin. The patients were kept quiet on the days of administration but were not necessarily confined to bed unless this instruction had been given for other reasons. No complaints were made of immediate sensations of nausea or shock. The patients rather liked the treatment, and there would have been no difficulty in the giving of a second course if this had appeared necessary. Careful assessment of the cases, carried out on a sufficient number of occasions, before, during and after the administration of merthiolate, failed to demonstrate any pronounced change in the patients treated and so they were not recommended for a further course. They remained approximately in the same condition as before.

Practitioner, London

139 521 632 (Nov.) 1937

- The Early Diagnosis of Pulmonary Tuberculosis A Morland—p 521
 Treatment of an Early Case of Pulmonary Tuberculosis G S Todd—p 528
 The Early Diagnosis and Treatment of Abdominal Tuberculosis R Lightwood—p 535
 The Early Diagnosis and Treatment of Tuberculosis of Bones and Joints in Children P Wiles—p 540
 The Early Diagnosis and Treatment of Tuberculosis of the Skin G B Dowling—p 551
 The Diagnosis and Treatment of Tuberculosis of the Larynx R S Stevenson—p 565
 Laboratory Aids in Diagnosis and Treatment of Tuberculosis S C Dyke and Eileen Harvey—p 572
 Diet in Health and Disease V Diet in Pulmonary Tuberculosis S V Pearson and G Day—p 584
 Palpitation R Hilton—p 592
 The Nature and Treatment of Acute Glomerular Nephritis C E Kellett—p 597
 The Causes of Lack of Progress at School and Their Treatment W L Neustatter—p 607
 Treatment of Scabies and Impetigo E W P Thomas—p 618

South African Medical Journal, Cape Town

11 707 750 (Oct 23) 1937

- The Public and Ourselves Some Points of Contact S M de Kock—p 709
 Need of Reorientation of General Practice C Theron—p 718
 Some Aspects of Sterility L J te Groen—p 725
 Medical and Health Institutions in the U S S R E H Cluver—p 727

Tubercle, London

19 49 96 (Nov.) 1937

- The Use of the Tomograph J B McDougall—p 49
 *Merthiolate in Treatment of Pulmonary Tuberculosis S M K Mallick, Shujat Ali and Balbir Singh—p 62
 Congenital Cystic Disease of Lung Removed by Operation Case T H Sellers—p 65
 *Sun Bathing in Tuberculosis Its Use and Abuse B Hudson—p 72
 Artificial Pneumothorax in Children C D S Agassiz—p 74
 Epidemic of Tuberculosis in Frogs W Burridge—p 80

Merthiolate in Treatment of Pulmonary Tuberculosis

—Mallick and his associates used merthiolate in twelve cases of pulmonary tuberculosis. They gave 5 cc of an aqueous solution of merthiolate (1:1,000) intravenously on alternate days. There was no toxic effect of the drug except in two patients who experienced slight shivering, a little dyspnea, general discomforts and rise of temperature after the first injection. In this respect the course of the treatment was uneventful in the rest of the cases. Lambert recorded improvement in seven of his eight cases. Of the authors' patients not one was better at the end of the treatment. The weight increased by 1 pound (22 Kg) in one case, which was perhaps due to the general treatment carried out in addition to the merthiolate injections. There was a partial abatement of fever in another patient, but the temperature did not come completely down to normal. Tubercle bacilli continued in the sputum in spite of the merthiolate, while the number actually increased in 50 per cent of the patients during treatment. The general condition of the patients showed no improvement. It appears that no definite therapeutic value can be attached to merthiolate in the treatment of pulmonary tuberculosis.

Use and Abuse of Sun Bathing in Tuberculosis

—Hudson states that the sun is a powerful means of treating certain disorders, especially beneficial in cases of surgical localized tuberculosis and certain other chronic surgical conditions not necessarily tuberculous. Patients with pulmonary tuberculosis should never be allowed to take sun baths, as they are definitely dangerous. But sun bathing may be prescribed when tuberculosis approximates the surgical type, being quiescent and localized, and in chronic pleurisy. Indiscriminate sun bathing can certainly light up an unsuspected, latent pulmonary focus. Sun treatment consists in the gradual exposure of the body to the light, not the heat, of the sun and patients who are taking sun baths should be surrounded by a proper circulation of free air. Sun treatment should always be supervised and controlled by a medical practitioner. The aim of sun bathing is not burning but pigmentation. When tuberculosis is of the scattered type, and especially if the patient shows a liability to fever, either periodic or continuous, or a tendency, on exertion, to autoinoculation, exposure to the sun should be strictly avoided, as it is likely to precipitate actively the spread of the condition. Sun bathing may be tried as an additional stimulus when a patient whose progress is slow is becoming cured.

Archives des Maladies du Cœur, Paris

30 745 840 (Oct.) 1937 Partial Index

- *Syncope from Effort in Aortic Stenosis Frequency and Diagnostic Value L Gallavardin—p 745
 Stokes Adams Disease with Ventricular Pauses of Long Duration Clinical and Electrocardiographic Study H Hermann R Froment and A Gouin—p 753
 Diagnosis of Right or Left Septoventricular Branch Block C Lian and V Golblin—p 787
 Tachycardia with Auriculoventricular Dissociation Case E Geraudel—p 796

Syncope from Effort in Aortic Stenosis—According to Gallavardin, syncope from effort may occur in heart disease, especially of the anginal type, is frequent in aortic stenosis of rheumatic or nonrheumatic origin and is constant in nonrheumatic pure or predominant aortic stenosis, in which it is of diagnostic value. It does not develop in benign aortic insufficiency. The development and intensity of the syncope are independent from the suffocation experienced by the patient during its course. The syncope of the "solitary" type is preceded by disturbances of the vision and dizziness. That of the common type is preceded by a thoracic or epigastric aura. Sometimes the syncope is prevented by the patient, who stands perfectly still on perceiving the premonitory symptoms. The anginal type is rare. According to the authors, the syncope is caused by sudden transient cerebral anemia, which originates in disturbances of the rhythm with a momentary arrest of the ventricular contraction and consequent insufficiency of the arterial output. The disturbances of the rhythm are due to myocardial insufficiency from aortic stenosis. The author's pathogenic theory is based on results of electrocardiographic studies, made in the course of the syncope from effort, in which he found that the heart did not stop contracting, whereas the pulse beat entirely disappeared during it. In this case necropsy showed intense degeneration of the myocardium. Three new cases are reported by the author.

Bull et Mem de la Soc Méd des Hôpitaux de Paris

53 1275 1332 (Nov 15) 1937 Partial Index

- *Virulence of Cerebrospinal Fluid in Course of Simple Mumps V de Lavergne P Kissel and H Accoyer—p 1276
 Encephalitis of a Type of Acute Delirium in Scarlet Fever Case R A Marquiez and P Rambert—p 1282
 Erythrema Variability of Globular Figures Constancy of Coagulability Disturbances Three Cases G R Doré R Deliscouet and Callegari—p 1287
 Curable Hyperazotemia May Be of Extrarenal Origin, Possibly from Duodenal Stasis in Course of Apyretic Acute Cholecystitis G R Dore and F Larchant—p 1293

Virulence of Cerebrospinal Fluid in Mumps—Lavergne and his collaborators inoculated eight rabbits suboccipitally with 1 cc of cerebrospinal fluid from eight patients suffering from simple parotitis. The changes in the cerebrospinal fluid were observed by puncturing the animals at intervals of four days for three or five weeks. At the end of the experiment, microscopic studies of the brain were made. Seven rabbits reacted with persistent hypercytosis (hyperlymphocytosis) during the first ten days. It diminished in the course of the experiment and showed a late recrudescence in five animals. The brain of the five rabbits which had early and late hypercytotic reactions showed microscopic changes of the type of neuraxitis and, in two cases, also of parotitic radiculitis. The brain of the two rabbits that had an early but not late hypercytotic reaction showed inflammation but no anatomic changes. The rabbit in which the cytology of the cerebrospinal fluid was normal did not develop meningitis. The authors conclude that the cerebrospinal fluid of patients who are suffering from simple parotitis is virulent for rabbits in almost all cases. The cerebrospinal fluid is virulent although the patients do not show clinical symptoms of meningitis and the fluid does not show important cytochemical alterations. The absence of meningitis complicating parotitis in men does not indicate absence of the parotitic virus in the brain. The development of meningitis in mumps does not show an abnormal location of the parotitic virus which is present in the cerebrospinal fluid in the course of simple parotitis in all cases. The development of clinical meningitis is probably due to an unknown cause which is independent of the presence or absence of parotid virus in the cerebrospinal fluid.

Archivio Italiano di Chirurgia, Bologna

47 139 252 (Oct.) 1937

- Traumatic Lesions and Polypeptidemia L Di Natale and M Tabanelli—p 139
- *Mechanism of Action of Hypertonic Solution of Sodium Chloride on Peristalsis G Perazzo—p 163
- Permanent Torsion of Renal Pedicle Researches M Agrifoglio—p 189
- Hemostasis with Catgut in Nephrotomy Without Sutures Experiments E Sacco—p 211
- Reestablishment of Cardiac Circulation by Means of Vital Muscle After Ligation of Coronary Arteries Experiments A Grassi—p 234

Hypertonic Solutions of Sodium Chloride and Peristalsis—Perazzo performed graphic determinations of the intestinal motility of dogs shortly before and after the administration of intravenous injections of 15 or 20 cc of a 20 per cent hypertonic solution of sodium chloride and also two hours later. The injection induces an increase of the intestinal tonus and of the amplitude of the pendular movements and appearance or acceleration of peristalsis in normal dogs as well as in those which are previously subjected to bilateral vagotomy. The effects disappear entirely in from twenty to forty-five minutes. A second injection induces the same motor reaction as that induced by the first one. The intestine does not react to further injections. According to the author, the motor effects of hypertonic solutions of sodium chloride are nonspecific. They are the result of disturbances of the ionic metabolism with consequent disorders of the osmotic pressure, especially on the intestinal walls. The increased concentration of ions on the walls of the intestine stimulates the local sympathetic innervation, which results in the appearance or acceleration of motor functions which are independent of the vagal innervation. The fact that the motor reaction of the intestine takes place only when sodium chloride is administered in a given concentration and amount shows the importance of the rupture of the metabolism of the ions in the development of the reaction. The latter does not take place after the injection of 15 or 20 cc of a normal solution or after that of 6 or 8 cc of a 20 per cent hypertonic solution of sodium chloride. According to the author, the results of his experiments confirm those reported in the literature as to the effect and mechanism of action of hypertonic salt solutions other than sodium chloride in accelerating intestinal peristalsis.

Riforma Medica, Naples

53 1507 1540 (Oct 23) 1937

- *Ascoli's Epinephrine Treatment in Malaria A Monaco V Cito and A Mangiacapra—p 1507
- Opothropic Effects of Medullary and Cortical Substances of the Adrenals V Gambini—p 1512

Epinephrine in Malaria—Monaco and his collaborators gave intravenous injections of progressive doses of from 0.01 to 0.05 mg of epinephrine (Ascoli's treatment) to six patients who were suffering from chronic malarial splenomegaly of the congestive and hyperplastic types. The injections were given daily up to a total of thirty. The spleen contracts energetically immediately after the injection, remains contracted for varying periods and then reexpands for two or three hours without regaining its former size. The results are the same for the congestive and hyperplastic types of splenomegaly for the first ten days of the treatment. Erythrocytes, leukocytes, malarial parasites and spleen juices are eliminated from the spleen during contraction. During the second ten days of the treatment contraction of the spleen is slight, especially in hyperplastic splenomegaly, and the structure does not reexpand. The last ten injections consolidate the effects of those previously given without producing contraction and reexpansion of the spleen. At the end of the treatment the spleen and the crisis of the blood become permanently normal in patients who suffer from congestive splenomegaly. The spleen is reduced in size and the crisis of the blood improved in those who suffer from hyperplastic splenomegaly. If recurrences take place in the course of the treatment they are controlled by administering small doses of quinine to the patient, 0.6 and 1 Gm on the day of the fever according to the type of malaria. According to the author, epinephrine acts by inducing immunity. The treatment is indicated in acute and chronic malaria. It does not cause after-effects and has no contraindications. It is of value in the treatment of malaria in soldiers, as they can return to duty soon after treatment.

Rivista di Patologia e Clin. d. Tuberculosis, Bologna

11 721 808 (Oct 31) 1937

- Behavior of Index of Expiration of Margins of Lung in Various Forms of Pulmonary Tuberculosis Before and After Interventions of Collapse Therapy G L Eltore and F Bagnoli—p 721
- *Mean Arterial Blood Pressure in Pulmonary Tuberculosis V Garraffo—p 741
- Diffusion and Evolution of Intrathoracic Tuberculosis in Children as Shown by Statistics of a Dispensary M Accoromboni—p 759
- Action of Phrenic Exeresis on Pulmonary Tuberculosis L Menozzi—p 773

Mean Arterial Pressure in Pulmonary Tuberculosis—Garraffo studied the behavior of the arterial blood pressure in thirty-eight patients, suffering from pulmonary tuberculosis, after an intramuscular injection of epinephrine or acetylcholine. The determinations were made while the patients were resting in bed several hours after meals. The mean arterial blood pressure is independent of the extreme pressure. It diverges from the maximal pressure in toxemic, evolutive and grave forms of pulmonary tuberculosis. It is an index for the functions of the heart. Cardiac insufficiency is frequently caused by pulmonary tuberculosis. The author states that comparative determinations of the maximal and mean arterial blood pressure, after administration of substances which induce modifications in the dynamics of circulation, are of value in estimating the functions of the myocardium. Concordance and convergence of mean and maximal pressure show efficiency of the heart, whereas divergence of the pressures shows functional insufficiency of the organ.

Revista Medica del Rosario, Rosario de Santa Fe

27 681 786 (Aug.) 1937

- Congenital Bronchopulmonary Malformations Clinical Study M N Vega—p 681
- Id. Congenital Cystic Images F P Cifarelli—p 698
- *Pathogenic Role of Tobacco Smoke in Cardiovascular Diseases T C Minnhaer—p 706
- Medullary Compression by Meningioma Case L Corbi Rodriguez J A Cereza and R Babbini—p 733

Tobacco Smoking in Cardiovascular Diseases—Minnhaer found by experimental and clinical studies that tobacco smoking has a harmful action on the cardiovascular apparatus. It increases arterial pressure, accelerates the cardiac beat, induces peripheral vasoconstriction and may cause angina pectoris or endarteritis obliterans in predisposed persons. The pathogenic role of smoking in cardiovascular diseases varies with the constitution of the patient and with the local reaction of the arteries of the heart and lower extremities to carbon monoxide absorbed by hemoglobin while smoking and also on the reaction of the arteries to local spasm. The author found that twenty-eight men who were suffering from angina pectoris or endarteritis obliterans had smoked excessively. Two women who were suffering from angina pectoris did not smoke. Disorders of the cardiac rhythm and a sensation of compression of the thorax developed in a group of smokers. When smoking was discontinued the disorders disappeared or their progress was stopped. The patients who again attempted smoking had a return of the same symptoms. The author advises further studies on the subject, not by experiments on animals but by observations on men. Smoking can be allowed only to normal persons, and then in moderation. It is also advisable to prohibit smoking by persons showing cardiovascular alterations, as well as to youths under the age of 18 and to pregnant and nursing mothers. Periodic examinations of the cardiovascular apparatus of smokers should be made in special departments of clinics for cardiac diseases. The public should be warned that cigarettes purported to contain no nicotine, or mentholated or medicated tobacco, are misrepresented and are given attractive names only for commercial purposes.

Deutsches Archiv für klinische Medizin, Berlin

181 1 124 (Sept 30) 1937

- Elimination of Minerals in Healthy Persons and Patients with Especial Consideration of Calcium W Bentz—p 1
- Endarteritis Obliterans of Organs W Hadorn—p 18
- *Bacteriologic Investigations on Fasting Persons Marie Theres Schnorbusch—p 55
- Fundamentals of Evaluation of Electrocardiogram in Healthy Persons and Patients L Delius and H Reindell—p 67
- *Gordon's Test in Hodgkin's Lymphogranulomatosis K Wurm—p 90

Bacteriologic Investigations on Fasting Persons—Schnorbusch reports observations on the behavior of the bacterial flora of the digestive tract during periods of fasting.

She observed an increase in the previously existing normal oral flora and the new appearance of bacteria, which on the whole may be regarded as belonging to the normal flora but which disappear six days after the fasting period. The examination of the upper part of the intestinal tract demonstrated that the bacterial flora of the duodenal juice is dependent on the acidity of the stomach. At the beginning of the period of fasting there were, in case of subacidity of the gastric juice, numerous bacteria in the duodenal juice, but after three weeks of fasting, in case of normal hydrochloric acid content, there were no bacteria. It was not proved whether the lack of food exerted an influence. Examination of the feces showed that the bacterial flora of the lower portions of the intestine was not changed by the fasting. Neither qualitative nor quantitative changes could be detected. The antagonistic behavior of colon bacteria toward pathogenic intestinal bacteria (typhoid bacilli) remains the same.

Gordon's Test in Hodgkin's Lymphogranulomatosis—Hodgkin's disease being comparatively frequent and apparently increasing in the region of Freiburg, Wurm decided to investigate the origin of the disease. He employed the biologic test described by Gordon. He reviews the symptomatology of this animal test and describes his own experiences with the test. He discusses problems that arise in connection with the intracerebral vaccination which is employed in Gordon's biologic test. Although a nervous disorder develops in guinea pigs, following their intracerebral inoculation with suspensions of material from glands with the signs of Hodgkin's disease, this nervous process could be caused by the suspected virus of Hodgkin's disease, for, as has been demonstrated in yellow fever and other diseases, the process elicited in the animal experiment does not necessarily have to be identical with the process in human subjects. However, in view of the fact that it was impossible to produce further animal passages of the disorder elicited by vaccination and because the agent could not be increased in tissue cultures, there is no definite proof for the virus nature of the causal agent assumed by Gordon. Moreover, since it seems to be identical with the agent, which Friedmann detected in normal human bone marrow, spleen, leukocytes and particularly pus, its specificity for lymphogranulomatosis must be denied. On the other hand, it is not identical with the proteolytic leukocyte ferment of Muller and Jochmann or with other ferments. The author points out further that the elementary bodies detected by Gordon cannot as yet be regarded as definite proof. Thus the virus theory of Gordon has neither been proved nor disproved. The biologic characteristics of Gordon's agent are applicable to a virus as well as to a ferment. Nevertheless, the practical diagnostic value of Gordon's biologic test was demonstrated in thirty-one cases of malignant granuloma, in eighteen cases with other types of glandular disorders and in numerous control experiments.

Medizinische Klinik, Berlin

33 1489 1520 (Nov 5) 1937 Partial Index

- Rheumatic Myocarditis W H Veil—p 1489
 *New Clinical Experiences with Transplantation of Hypophysis E Klyn—p 1497
 Brown Ring of Forehead and Symmetrical Gangrene in Dementia Paralytica W Schonfeld—p 1500
 Malaria Therapy in Poliomyelitis O Kauders—p 1502
 Oligosymptomatic Syndrome of Cushing F W Schimmelpfeng—p 1506

New Experiences with Transplantation of Hypophysis—Klyn reviews an earlier report on the transplantation of hypophyseal tissue from animals to man (see also abstract in *THE JOURNAL*, Jan 23, 1937, p 342) and then reports his more recent experiences with the method. Immediately after slaughtering, the head of the animal (calf) is rushed to the hospital, where the patient who is to receive the transplantation is being prepared for the operation. The hypophysis is extirpated from the head of the calf under sterile conditions and is placed in physiologic solution of sodium chloride of a temperature of 37 C (98.6 F). After it has been cut into four or six parts, each of these parts is sutured into a separate pocket of the mesentery or peritoneum of the patient. Only from half an hour to an hour elapses between the slaughtering of the animal and the transplantation of the hypophysis into the

patient. The author emphasizes that in this respect his method differs from that of others, who place the animal hypophysis first on ice. He thinks that his more favorable results can be explained in this manner, for whereas by his rapid method the hypophyseal cells are transplanted while still viable, the freezing process impairs the viability of the cells. The author employed hypophyseal transplantation in thirty-eight cases of Simmond's disease (including the subgroup of late puberal emaciation), three cases of adiposogenital dystrophy, five cases of total alopecia, three cases of hypophyseal dwarfism, six cases of psoriasis and five cases of indefinite endocrine disorders with symptoms of hypopituitarism. Discussing the results in the cases of Simmond's disease, he says that in the twenty-two cases in which more than a year has elapsed since the transplantation, eighteen patients could work again, but two of these died of intercurrent diseases and two had a relapse, so that now there are fourteen who are still able to work. In three other patients the transplantation proved a failure and another patient, although somewhat improved, later died of pulmonary tuberculosis. In citing the results obtained in the other disorders, he says that he resorted to hypophyseal transplantation in psoriasis because recent investigations seem to indicate that it is caused by an incretory disturbance in the fat metabolism and that the hypophysis excretes a fat splitting hormone. In one especially severe case of psoriasis which had proved refractory to a number of therapeutic measures, and in three milder cases, the hypophyseal transplantation proved effective, but it failed in one mild case. The author also makes suggestions regarding the possible mode of action of the hypophyseal transplants.

Munchener medizinische Wochenschrift, Munich

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- The Cycle in Women J Samuels—p 1681
 Electrosurgical Interventions in Gynecology H Fuchs—p 1688
 Prophylaxis and Therapy of Intra Uterine Asphyxia E Vogt—p 1690
 Practical Suggestions for Combating Early Mortality O Rommel—p 1692
 *Necroses of Renal Papillae in Diabetes G W Gunther—p 1695
 The Drinking Fetus Roentgenologic Study K Ehrhardt—p 1699
 *Treatment of Dermatoses of Ovarian Origin with Estrogen Ointment W Reifferscheid—p 1700

Necroses of Renal Papillae in Diabetes—Gunther directs attention to the high incidence of necrosis of the renal papillae in patients with diabetes mellitus. He found that of ten patients with necrosis of the renal papillae eight had diabetes and he thinks that diabetes should be thought of in patients with necrosis of the renal papillae. On the other hand, if a diabetic patient develops an ascending infection of the urinary passages, there is cause to fear the more or less early development of necrosis of the renal papillae. Because of the predisposition to infection in patients with diabetes mellitus, ascending inflammation of the urinary passages may develop even in the absence of an obstruction of the urinary discharge. This process often takes a rapid course, unobserved by the patient or by the physician, and if both kidneys become involved a urosepsis may develop, a diabetic coma may thus develop into a fatal uremia. If only one kidney becomes involved, general symptoms may be absent until a cast-off papilla passes the ureter, thereby causing colic-like pains, as well as stasis of purulent urine with fever and chills. After the patency of the involved ureter is reestablished, the general manifestations subside. However, the severe destruction of the renal parenchyma, which has been produced by the papillary necrosis, persists and may lead to differential diagnostic difficulties. The discrepancy between the comparatively mild inflammation of the deeper urinary passages (bladder and renal pelvis) and the severe changes in the kidneys are almost characteristic for necrosis of the renal papillae in patients with diabetes mellitus. Necrosis of the renal papillae in patients without diabetes, however, is preceded for a long time by severe inflammations of the lower urinary passages. There is no non-inflammatory, that is, mechanical, pathogenesis of necrosis of the renal papillae.

Ointment with Estrogen in Ovarian Dermatoses—Reifferscheid directs attention to the local application of estrogen in cutaneous disturbances that develop in connection with disturbances in the menstrual cycle. He reports the history of a

woman, aged 24, who presented the symptoms of symmetrical dysmenorrheal dermatitis. Irregularities in menstruation were accompanied by the development of efflorescences. Following severe itching, a reddish discoloration of the skin occurred and a swelling as in urticaria developed with small vesicles on the slightly raised follicles. In the further course, the superficial layers of the skin became detached, and severely weeping and itching lesions developed which persisted for several days or a week and then dried in the form of yellow crusts. After the detachment of these crusts, a reddish and later a brownish yellow discoloration of the skin was present for some time. The eczema involved especially the region of the mouth and chin, the forearms, the chest and the back. When the woman came under the author's observation, amenorrhea had existed for ten weeks. An intramuscular injection of estrogen was given and eight days later menstruation set in. During the following months the injections of estrogen were given regularly and the menstrual periods recurred at regular intervals. The eczema was treated with an ointment which contained a preparation of estrogen extracted from the placenta. This ointment, which was prepared by the author himself, and which contained 5,000 international benzoate units per gram, was massaged into the skin once or twice daily. Under the influence of this treatment, the cutaneous disorder rapidly disappeared. It was found that when only one arm was treated with the ointment the efflorescences on this arm disappeared, whereas they remained unchanged on the untreated side. During the following year the patient had a relapse. This, like the earlier attack, was elicited by a mental shock and again yielded to the estrogen ointment. After pointing out that Jaffe effected cure in acne vulgaris by the local application of ointment containing estrogen, the author suggests that the percutaneous application of the estrogen ointment deserves a trial, particularly in refractory cases of dysmenorrheal dermatitis.

Wiener klinische Wochenschrift, Vienna

50 1475 1506 (Oct 29) 1937

What Practitioner Ought to Know About Short Wave Therapy J Kowarschik—p 1475

*Thrombopenias Classification and Aspects of Bone Marrow H Fleischhacker—p 1480

Studies on Regulatory Processes in Carbohydrate Metabolism Experiments with Double Epinephrine Tolerance Test K Paschkis and Annie Schwoner—p 1483

Distribution of Calcium in Human Blood P Fantl—p 1486

Survey of Indications and Technique of Pneumoperitoneum P Alimenti and H Neumann—p 1487

Clinical Aspects of Renal and Ureteral Calculi I Iacobovici E Teposu and Danicico—p 1488

*Mild Insulin Shock as Hypnotic and Anodyne J Wegierko—p 1490

Thrombopenias Classification and Aspects of Bone Marrow—Fleischhacker demonstrates that the pathogenesis of thrombopenic purpura is not uniform. For the proper estimation of all factors that may play a part, it is necessary to study the behavior of the bone marrow. Considering the changes in the bone marrow, two forms can be differentiated. The first type consists of the symptomatic thrombopenias. In this type it is possible to demonstrate an impairment or a severe transformation of the bone marrow, which leads to a modification of the giant cells. To the second group belong the essential thrombopenias in which no eliciting cause can be recognized. In the majority of these cases there exists an increase in the megakaryocytes and megakaryoblasts (deviation to the left). The author is inclined to believe that an increased consumption of thrombocytes plays a part which, in turn, is largely caused by a deficient vascular function. The spleen is of importance in that it is responsible for the condition of the capillaries. In cases in which only few megakaryocytes are present a splenogenic inhibition of the bone marrow must be taken into consideration. The thrombopenia, which is caused by anaphylactic, hyperergic processes, is regarded by the author as a third distinct form. To be sure, in view of the fact that its eliciting cause is usually readily demonstrable, it may be classified with the symptomatic forms, but it differs from these by the absence of severe medullary changes.

Mild Insulin Shock for Insomnia—Wegierko says that in his report on insulin shock in the treatment of bronchial asthma he made the suggestion that in view of the spasmolytic effect of the insulin shock it could be employed in painful con-

ditions that are accompanied by spasms. In another connection he had pointed out that insulin shock might be used as a hypnotic. He reports the history of a man, aged 42, who was receiving treatment for addiction to morphine. In the course of the withdrawal treatment the patient suffered from insomnia that could not be counteracted by barbituric acid preparations. The injection of 40 units of insulin, from five to six hours after the last meal, resulted in mild symptoms of shock (tremor, feeling of weakness and slight sweating). The patient was given some tea containing from seven to eight teaspoonfuls of sugar. After that the patient slept uninterruptedly for eight hours. This insulin shock was repeated daily, always with the same beneficial effect. Later the author used insulin shock with good results in insomnias of various origins. He emphasizes that to induce sleep the insulin shock does not need to be severe. Sleep results even if the shock symptoms are immediately interrupted by the administration of sugar. The author admits that his material is too small to warrant a final evaluation of insulin shock in the treatment of insomnia. However, he asserts that it is entirely without danger and more pleasant than the customary hypnotics. He relates his experiences also on the spasmolytic effect of insulin shock. He found insulin shock effective in renal and biliary colics, migraine, spurious angina pectoris, neuralgias, sciatica and so on. He administers 40 units of insulin subcutaneously or 20 units intravenously. These rather large doses are without danger, because the shock can be interrupted immediately by the oral or intravenous administration of sugar.

50 1507 1538 (Nov 5) 1937 Partial Index

Question of Artificial Cerebral Tumors O Marburg—p 1509

*Hypophysis and Protein Metabolism K Paschkis and Annie Schwoner—p 1516

Interrelations Between Inflammatory Diseases of Female Genitalia and Rectum Sigmoid Treatment E Schleyer—p 1519

Eczema as Result of Hypersensitivity to Digitalis Purpurea R Brandt—p 1525

Experiences with Freund-Kaminer's Cancer Reaction M Plonskier and R Cyterman-Kon—p 1526

The Hypophysis and Protein Metabolism—Paschkis and Schwoner state that in a former report they described a regulatory mechanism of the protein metabolism. They say that, if human subjects are given a tolerance test with 50 Gm of gelatin and about three hours later the same tolerance test, it can be found that after the second tolerance test the increase in the amino nitrogen content of the blood is either entirely absent or at least not comparable to the increase after the first tolerance test. It was assumed that the hypophysis might play a part in this regulatory mechanism and further investigations were made. It was found that the gonadotropic principle from the urine of pregnant women exerts no definite influence on the alimentary amino acidemia. To be sure, since the actual hypophysial origin of this principle is still debatable, tests were made also with preparations from the anterior hypophysis itself. In tolerance tests with 50 Gm of gelatin, the simultaneous administration of two different preparations of the anterior hypophysis resulted in low amino nitrogen curves in the blood. It was found also that anterior hypophysial extracts according to Evans have a decreasing effect on the urea nitrogen and amino nitrogen of the blood. In three cases of hypophysial cachexia the double gelatin tolerance test revealed the absence of the normal regulatory effect. This is ascribed to a deficient elimination by the anterior lobe of the hypophysis of the hormone regulating the protein metabolism. In a case of acromegaly, the regulatory effect was likewise absent. The authors further describe attempts at the biologic demonstration of the hormone of the protein metabolism in the serum.

Bibliotek for Læger, Copenhagen

129 341 375 (Oct.) 1937

*Bacteriologic Epidemiologic Experiences Concerning Infections with Gastro-Enteritis Bacilli of Paratyphoid Group Ccn M Kristensen K Bojlen and C Faarup—p 341

Gastro-Enteritis Bacilli of Paratyphoid Group—Kristensen and his associates review investigations carried out at the Serum Institute from 1924 to 1936. They supplemented the serologic and cultural examinations to make sure that all the strains kept were examined according to a uniform plan and, mainly on the basis of the cultural relations, set up a

type classification of *Salmonella typhi* murium and *S. enteritidis*. A number of strains from birds and guinea pigs also were examined. The duck strains, the authors state, belong to two closely related types, both also found in man, one of which is by far the most common of their *typhi* murium types. The characteristics on which their classification of types is based are constant, but in rare cases certain changes may appear. The clinical course and the Widal reaction support the assumption that the so-called gastro-enteritis bacilli, when established in acute intestinal disorders, are, at least in Denmark, almost always the bacterial cause of the disturbances. The few instances are reviewed in which more than one of the pathogenic bacteria have been established in one and the same patient. Comparison with earlier experiences concerning infection with *Brucella abortus* Bang reveals differences on several points, in part to be explained on the assumption that "contact infection" from animals is without significance as the cause of *Salmonella* infections in man, and that in transmission through foodstuffs the possible opportunity for abundant growth in these plays an important part. Infants seem especially susceptible to infections with gastro-enteritis bacilli of the paratyphoid group. Milk appears to be the source of infection not only in epidemics but also in scattered cases of *Salmonella typhi* murium infection. To further our still incomplete knowledge of the sources of infection with gastro-enteritis bacilli, investigations on the occurrence of the special types in the animal kingdom will be necessary.

Norsk Magasin for Lægevidenskapen, Oslo

98 113 224 (Feb.) 1937

- *Treatment of Rectal Carcinoma M Kirschner—p 113
- *Infectious Mononucleosis H J Ustvedt—p 139
- Kidney Disease with Malformation Five Cases K. Haugseth—p 144
- Acute Serous Peritonitis P Treider—p 151
- Statistics on Cancer of Breast from Surgical Division of Aker Hospital T Leegaard—p 163
- Brief Reports from Rikshospitalet's Pathologic Anatomical Institute F Harbitz—p 176

Rectal Carcinoma—Kirschner advocates an artificial anus only if there is hope that through it a radically inoperable case may become operable or if certain symptoms demand it. He says that in many cases an artificial anus fails to fulfil the hopes attached to it, especially in allaying pain from the carcinoma. Two available procedures are electrocoagulation of the tumor, with rectum and wound left open after rectotomy and a broad tamponade used, allowing direct roentgen or radium treatment later, or, if the disorder is no longer limited to the rectum, resection of the hypogastric plexus or chordotomy, the latter to be bilateral even in case of unilateral pain. In cases in which radical operation can be performed, he says, his own and most other statistics show that the theoretical advantages of the combined resection have not been confirmed in the practice, although the operative mortality in the combined method is steadily decreasing. He asserts that a number of the disadvantages of the combined resection could be avoided if the two interventions were synchronized. If the patient is placed in so high a pelvic position that the buttocks extend over the edge of the table, the two operative fields are simultaneously accessible. Kirschner's specially constructed table is short and can be tipped almost vertically, the patient's legs, flexed at right angles at the hips and knees, are securely held and the shoulders rest on supports with rubber cushions. Spinal anesthesia is used. The chief surgeon, the abdominal operator, works from across the patient's head, his subordinate sits before the anus. Each surgeon has two assistants, a nurse and his instruments. The technic is simple. There is no change of position, disturbing the sepsis and taking time. Time is also saved because of the simultaneously performed parts of the operation. If the right mental attitude exists between the two surgeons, the intervention is carried out with unusual ease and certainty. If the synchronous cooperation is contrary to a surgeon's feeling and sense of responsibility, it is pointed out that the work of the posterior operator does not differ essentially from that of the responsible first assistant in other operations. If a surgeon nevertheless cannot overcome his disinclination for the simultaneous independent performance of a second surgeon, he can, with the patient in the position described, himself carry out in turn the upper and the lower intervention.

Infectious Mononucleosis—Ustvedt stresses that the frequent difficulties in differentiating between leukemia (acute myeloblast leukemia) and infectious mononucleosis can be met by sternal puncture. In myeloblast leukemia the sternal punctate shows a fairly uniform picture, the marrow is particularly rich in cells, which are almost exclusively mononuclear, varying somewhat perhaps in size but having about the same appearance in nuclear structure and protoplasm. In infectious mononucleosis the cells in the marrow are not so abundant and different cell forms are found, granulocytes in different stages, erythroblasts and a few mononuclear cells, a certain degree of lymphatic metaplasia in the bone marrow cannot be excluded. Transition forms between lymphocytes and monocytes in the blood testify that monocytes can develop from lymphocytes, as asserted by Nyfeldt.

98 225 328 (March) 1937

- Individually Dosable Girdle Spinal Anesthesia with Determinable Limit M Kirschner—p 225
- Lead Determinations in Organs from Two Lead Workers K Hansen K Wulfert and E Kvalheim—p 253
- Pathology of Necrotic Roentgen Sore B Dahl—p 260
- Results of Necropsies in Cases of Sclerosis J Frimann Dahl—p 273
- *Holla Disease Epidemic Occurrence of Anemic Crises in Hemolytic Jaundice H G Dedichen—p 279
- Ishihara's Test for Color Blindness—Abbreviated Test for School Physicians S Holth—p 296

"Holla Disease" Epidemic Occurrence of Anemic Crises in Hemolytic Jaundice—Dedichen says that eighteen members of two families in Holla, Norway, had hemolytic jaundice, which is transmitted as a dominant factor. In the course of eight months there occurred thirteen cases of acute disorder, with fever, enlargement of the spleen, anemia and, in several instances, pronounced cerebral symptoms. Many of the patients were given blood transfusion, with excellent effect in most cases, aggravation followed in some, and one patient died after transfusion. These patients are believed to have been exposed to an infection with unusual power to destroy red blood corpuscles, or the patients' resistance to hemolytic factors has been especially low. In others the infection presumably caused banal, influenza-like symptoms, as seen in one of the normal Holla children. Anemic crises are rare in hemolytic jaundice. The only really effective treatment in hemolytic jaundice is extirpation of the spleen, but it is called for only in the relatively few cases in which the condition interferes with the ability. Otherwise the usual tonics can be given, arsenic especially seeming to be helpful. Iron is without effect. Improvement in the general condition has a favorable influence on the anemia and the jaundice. The disturbance should be borne in mind, for because of the altered resistance of the patients toward different injuries it can be the cause of complications that may be grave and may cause diagnostic difficulties.

Ugeskrift for Læger, Copenhagen

99 1141 1162 (Oct 28) 1937

- Insufficiency of Synthetic Cevitic Acid as Antiscorbutic A Elmby and E Warburg—p 1141
- Ulcerative Colitis and Vitamin P C E Zacho—p 1143
- *Investigations on Frequency of Ulcer of Stomach and Duodenum with Especial Regard to Apportionment Between Sexes Fourteen Thousand Cases J L Hansen—p 1145

Ulcer of Stomach and Duodenum—Official reports of 14,000 cases of gastric and duodenal ulcer treated in the medical divisions of the Copenhagen hospitals, Hansen says, show that during the first decade of this century the disorder predominated in women, was equally divided between the two sexes in the second and appeared in constantly increasing frequency in men in the third decade and the first half of the fourth. He considers the sources of error in the figures from the annual reports and the possibility of judging the situation in the populace from these figures and concludes that a shift in the apportionment between the sexes has really taken place. The absolute frequency of the disorder seems to be on the increase. The material offers no evidence as to the cause of the change. Study of hospital reports from Aarhus and Malmø reveals similar conditions. The shifting in the frequency of gastric and duodenal ulcer may perhaps contribute an explanation of the fact that at necropsy most ulcer cicatrices are found in women, most open ulcers in men.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 110, No 2

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CHICAGO, ILLINOIS

JANUARY 8, 1938

PROTAMINE ZINC INSULIN

CLINICAL APPLICATION

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NEW YORK

A remarkable step forward in insulin therapy was achieved by Hagedorn¹ when he discovered protamine insulin. The addition of zinc to protamine insulin was suggested by Scott and Fisher,² zinc further enhances the prolonged action of protamine insulin and renders the mixture stable for a period of at least six months. Protamine zinc insulin is the only protamine insulin combination obtainable today. Protamine zinc insulin in many cases lowers the blood sugar for much more than twenty-four hours,³ while protamine insulin acts for only twelve to fourteen hours. Consequently the observations made with protamine insulin, splendid as they have been, are not applicable to the management of diabetes with protamine zinc insulin, and to a great extent new plans of treatment must be developed.

The diabetic cases observed have been derived mainly from three sources. First, a series of thirty-seven cases at Sea View Hospital. This is a large institution for the treatment of tuberculosis, in none of these cases was the tuberculosis severe enough to affect the diabetes appreciably. The advantage of this group was that they remained in the hospital continuously and could be controlled and checked for a period of months. (Such an extended interval for study has made Krarup's⁴ monograph the most convincing of all the publications on protamine insulin.) Drs Mark and Sackey watched these patients very carefully and made a large number of blood sugar determinations on them. Second, a series of ambulant diabetic patients who were systematically treated in the course of office practice. These cases afforded an opportunity to determine what can be accomplished in the use of protamine zinc insulin without hospitalization. Third, subjects who were seen casually, that is, for only a short period in hospitals, dispensaries or the office.

Drs Carl H Greene, Leonard F Jourdonais, Morton F Mark and M S Sackey supplied data on and studied the cases observed in this article.

Read before the Section on Pharmacology and Therapeutics at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N J, June 11, 1937.

1 Hagedorn H C. Presentation at Nordisk Congress for Internal Medicine, Copenhagen, June 29, 1935. Hagedorn H C, Jensen B N, Krarup N B and Wodstrup I. Protamine Insulinate. J A M A. 106: 177-180 (Jan 18) 1936.

2 Scott D A and Fisher A M. Effect of Zinc Salts on Action of Insulin. J Pharmacol & Exper Therap. 55: 206 (Oct) 1935.

3 Rabinowitch I, M Foster, J S Fowler, A F and Corcoran A C. Clinical Experience with Protamine Zinc Insulin and Other Mixtures of Zinc and Insulin in Diabetes Mellitus. Canad M A J. 35: 239 (Sept.) 1936. Wilder R M. The New Insulin. Minnesota Med. 20: 6 (Jan) 1937.

4 Krarup N B. Clinical Investigations into the Action of Protamine Insulinate. Copenhagen. G E C Gad 1935.

PURPOSE OF PROTAMINE ZINC INSULIN

The lives of diabetic patients may be prolonged indefinitely with the use of regular, soluble insulin. The sacrifices that are made in the severe case are that as many as four hypodermics may be required during the day and that meals must be taken in proper relation to the injection. In other words, a person suffering with diabetes has all the privileges of a normal individual except with regard to meals and the use of insulin, to a certain extent, therefore, the diabetic patient must be on an exacting schedule throughout the day. The resort to protamine zinc insulin should do away with these restrictions, the ideal to be attained is that one dose of protamine zinc insulin is given in the morning before breakfast when the routine preparations for the day are carried out, and the meals are taken at optional hours with no anxiety about their being served exactly on time. Any deviation from this schedule does not fulfil the complete purpose of protamine zinc insulin. An effort was made to determine how protamine zinc insulin can be given most effectively and to establish, if possible, a functional pathologic conception which would serve as a guide for the use of protamine zinc insulin in the treatment of diabetes.

GUIDES FOR THE USE OF PROTAMINE ZINC INSULIN

The most satisfactory measure for the adequate effect of protamine zinc insulin is the blood sugar, which should be regulated so that excessive hyperglycemia and marked hypoglycemia are prevented. The variations permissible in individual patients differ a great deal, since the degree of hyperglycemia which oversteps the renal threshold, resulting in glycosuria, and the level to which the blood sugar can be depressed before hypoglycemic reactions appear are very far from fixed values. Phases of blood sugar which are of practical significance in the control of diabetes with protamine zinc insulin are:

- 1 Basic blood sugar level
- 2 Paroxysmal hyperglycemia
 - (a) Postprandial
 - (b) Nerve tension
 - (c) Menstrual
- 3 Paroxysmal hypoglycemia
 - (a) Exercise

Changes from the normal of the basic blood sugar, i e, the blood sugar while fasting, and the postprandial hyperglycemia exist in all but the mildest cases of diabetes. The other variations listed do not occur constantly and should be regarded as complications, which may or may not have to be considered. The deviation in the basic blood sugar and the postprandial hyperglycemia is not the same in all diabetic patients and that is probably why a uniform method of insulin admin-

istration and dietary prescription will never be applicable to all cases, and individual requirements must be conceded

BASIC BLOOD SUGAR LEVELS

The blood sugar at the time of the morning fast may vary in three ways. It may be normal and remain so, it may be elevated and drop on further abstinence from food, or, as a third possibility, the fasting hyperglycemia may become more

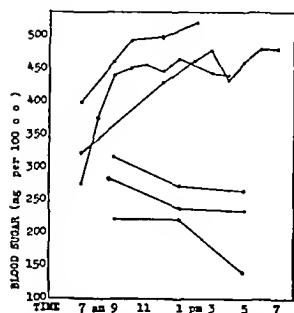


Chart 1—Blood sugar curves fasting in three severe and three mild cases of diabetes. Three upper curves: severe diabetes fasting no insulin. Experiments could not be continued for twenty-four hours because of acidosis and threatened coma. Rise of blood sugar to a high level which is constantly maintained. Early morning blood sugar comparatively low regular insulin on previous day (Experiment of Dr. Carl Greene). Three lower curves: mild diabetes fasting. The patients have never received insulin. Early morning blood sugar comparatively high. Drop of blood sugar with fasting. Contrast this with blood sugar in the severe cases in which insulin was given on the previous day.

the experiment could not be continued because of acidosis and threatened coma, these patients could not have been kept alive by any form of treatment except insulin. Lack of available insulin from the pancreas is probably the cause of the rise of blood sugar on fasting, and the same cause would bring about a postprandial hyperglycemia, so that the more severe the diabetes the higher the blood sugar both from endogenous (basic hyperglycemia) as well as from exogenous sugar (postprandial hyperglycemia). However, one point should be kept in mind: the basic hyperglycemia can be checked only by injections of insulin, while the postprandial hyperglycemia, besides being controlled by insulin, may be modified by diet.

POSTPRANDIAL HYPERGLYCEMIA

In advanced diabetes, after the ingestion of food, the blood sugar undoubtedly rises. An attempt was made to carry out a blood sugar curve in some of the severe cases, but it could not be completed because a marked acidosis developed and the use of insulin was urgently indicated. Blood sugar curves in diabetic patients who have never received insulin show that the postprandial blood sugar may rise, fall or remain unchanged (chart 2). These curves are derived from observations made before the discovery of insulin.

The variations in the blood sugar after meals must depend on the amount of insulin secreted by the pancreas when stimulated by the absorption of food. It is interesting to note that at times there is an over-

response, and the blood sugar may even pass into the hypoglycemic range. It is apparent from this study that when the pancreas is still active the effect of meals on the blood sugar is almost unpredictable, and due caution must be exercised in administering protamine zinc insulin.

CONTROL OF BASIC AND POSTPRANDIAL HYPERGLYCEMIA WITH PROTAMINE ZINC INSULIN

Patients confined in a hospital are largely free from the influence of nerve tension and exercise on the blood sugar. Hence the thirty-seven cases observed at Sea View Hospital furnish an ideal material by which to judge of the control of the basic and postprandial hyperglycemia with protamine zinc insulin. It was found that the patients requiring smaller doses of protamine zinc insulin showed almost ideal control, while those having need for larger amounts were prone to have a basic hypoglycemia, noted from midnight to 6 a. m., and a postprandial hyperglycemia (chart 3). The same idea is expressed by the median blood sugar curves obtained from each group (chart 4).

The remedy for the lack of control when massive doses of protamine zinc insulin are required may be one of several. Either the protamine zinc insulin and the carbohydrate content of the diet are diminished, thus raising the basic blood sugar and lowering the postprandial hyperglycemia, or the carbohydrates are increased and distributed as evenly as possible throughout the twenty-four hour period, evening feedings, at about 11 p. m., of crackers and milk have been resorted to by many clinicians and have proved to be very helpful, the six meal schedule, with a high starch content advocated by Rabinowitch, is very efficacious, but such a regimen makes living an irksome task and that is the main point which it is desired to obviate in resorting to protamine zinc insulin. In some instances the situation has been remedied by administering regular insulin with protamine zinc insulin, here again, while control of the diabetes may be obtained, there is a

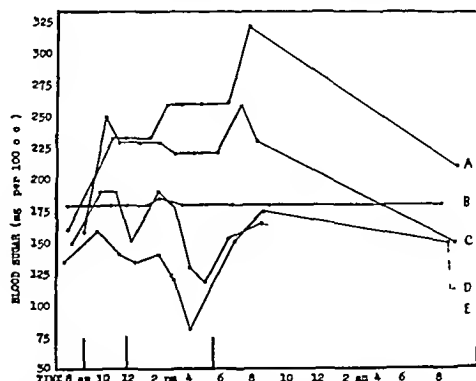


Chart 2—Blood sugar curves in diabetic patients who have never received insulin. The diurnal blood sugar curves are not constant; the blood sugar may rise, fall or remain unchanged. A, progressive staircase rise after meals; B, unchanged by meals; C, rise after breakfast and supper; D, paradoxical drop after lunch; E, rise and recession after each meal.

deviation from the true purpose of the use of protamine zinc insulin because multiple injections of insulin add much to the complexity of living.

PAROXYSMAL HYPERGLYCEMIA DUE TO NERVOUS TENSION

In some diabetic patients nerve tension results in frequent and marked hyperglycemia, so that alternations of glycosuria and hypoglycemic reactions occur.

Such cases can be much better served, as a rule, by the use of regular insulin without protamine zinc insulin, or combined with small doses of protamine zinc insulin, so that a flexibility of insulin effect may be maintained to accommodate itself to the unpredictable variations in the blood sugar of high strung persons

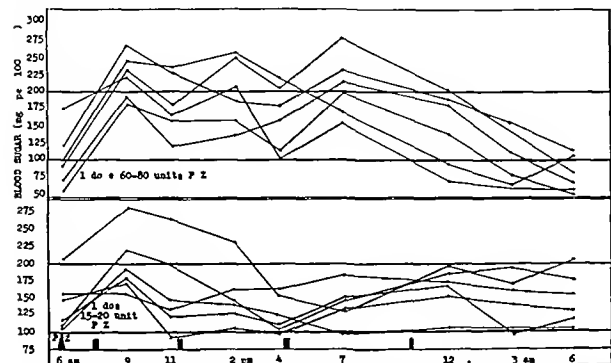


Chart 3—Blood sugar curves (arterial blood) in diabetic patients receiving a large dose of protamine zinc insulin (upper curves) and a small dose of protamine zinc insulin (lower curves). With the larger dose hyperglycemia is prone to occur from midnight to 6 a m and hyperglycemia during the day with the smaller dose such variations in the blood sugar are not found and the blood sugar is prone to remain within the normal range throughout the twenty four hours

PAROXYSMAL HYPERGLYCEMIA ASSOCIATED WITH MENSTRUATION

There may be marked paroxysmal hyperglycemia associated with menstruation.⁶ It probably accounts for some of the transient glycosurias in female diabetic patients, care must be exercised that if such hyperglycemias are corrected by raising the protamine zinc insulin at the time of the menstrual period there is not subsequently an overdosage of insulin entailing hypoglycemic reactions

PAROXYSMAL HYPOGLYCEMIA AFTER EXERCISE

Exercise increases the consumption of sugar in normal persons, in patients with mild diabetes or in patients with severe diabetes under the direct influence of insulin. However, "in the fasting patient with severe or moderately severe diabetes who has received no injection of insulin for several hours, the immediate result of exercise may be that of raising the blood sugar level."⁷

Exercise, therefore, brings about an augmented utilization of dextrose only when a reserve supply of insulin is available, if this supply does not exist, physical effort may result in an elevation of the blood sugar and glycosuria. Marble and Smith⁸ believe that protamine zinc insulin, even when administered many hours before, should accomplish the digestion of sugar after exercise. Their theory has in my experience proved correct. The hypoglycemic reactions following physical effort in diabetic patients using protamine zinc insulin have been very marked. Substantial amounts of carbohydrate, such as bread and milk, taken before golf, tennis, baseball, walking and the like will usually suffice to control the blood sugar, however, in some patients the hypoglycemic reactions were so severe that protamine zinc insulin had to be abandoned and regular insulin substituted.

HYPOGLYCEMIC REACTIONS

Hypoglycemic reactions have been less frequent with protamine zinc insulin than with protamine insulin. It is probable that in attempting to control the diabetes by one injection of protamine insulin which lasted for only twelve hours there was a tendency to overdosage. The reactions do not occur as often with protamine zinc insulin as with regular insulin but are prone to be more severe and prolonged. As mentioned previously, the hypoglycemia after exercise and the attempt to correct the hyperglycemia of nervous tension and of menstruation by increasing the protamine zinc insulin are common causes of reactions. When regular insulin is given in conjunction with protamine zinc insulin, the effects of regular insulin on the blood sugar are much enhanced and hypoglycemia often results.

In all cases presenting hypoglycemic reactions while under careful hospital supervision it was noted that tremor and perspiration were much more frequent with regular than with protamine zinc insulin, that palpitation, irritability and blurred vision occurred with equal frequency, but that headache was much more often complained of while the subjects were under the influence of protamine zinc insulin. When a change was made from regular insulin to protamine zinc insulin in the office cases, a slight to moderate headache on waking in the morning was often complained of, this appears to be an indication of hypoglycemia in the early morning hours and should be corrected by late evening meals or by lowering the dose of insulin.

USE OF PROTAMINE ZINC INSULIN FOR HOSPITALIZED OR AMBULANT PATIENTS AND IN COMA

In my experience there never has been any difficulty in treating diabetic patients with protamine or protamine zinc insulin while ambulant. More frequent calls at the office will be necessary until the situation is controlled, after which matters usually proceed uneventfully in routine fashion as when regular insulin is used.

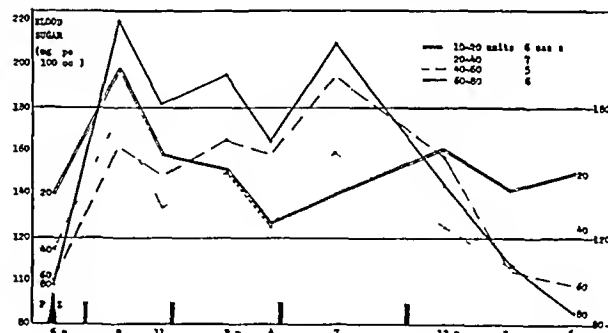


Chart 4—Mean blood sugar curves (arterial blood) of twenty four diabetic patients receiving one dose of protamine zinc insulin. The higher the dose of protamine zinc insulin the lower the blood sugar in the early morning and the higher the blood sugar during the day.

The hospitalized patients are often satisfactorily and readily adjusted, only to have the situation changed entirely on discharge, when the hyperglycemia of nerve tension and the hypoglycemia after exercise become factors in the daily life of the diabetic patient. There is much to be said for the idea that the most permanently satisfactory regimen, the quickest regulation and the greatest economy of time and expense are accomplished by office or dispensary management as compared to hospitalization.

6 Harrop G A and Mosenthal H O Influence of Menstruation on Acidosis in Diabetes Mellitus Bull Johns Hopkins Hosp 29 161 (July) 1918

7 Marble Alexander and Smith Rachel M Exercise in Diabetes Mellitus Arch Int Med 55 577 (Oct) 1936

Protamine zinc insulin may be given in diabetic coma without hesitation. I have used protamine insulin as well as protamine zinc insulin. After its administration the physician has to stand by to buffer the progressive hypoglycemia every hour or two, and the insulin treatment has been irrevocably established for a period of twenty-four hours. The use of regular insulin is obviously more flexible in handling emergencies in diabetic patients whose carbohydrate metabolism will change from hour to hour, a greater freedom of regulation is given with regular than with protamine zinc insulin. However, whether regular or protamine zinc insulin, or a combination of the two, is resorted to in handling the emergencies of diabetes is a matter of no great difference and may be taken up by each physician to meet his own conceptions of how the disturbed functions can most readily be returned to a normal state.

PROTAMINE ZINC INSULIN U 80

Thus far only protamine zinc insulin U-40 is available in the open market. It is obvious that U-80 is desirable, especially for those patients receiving more than 40 units at a single injection. Lilly, Mulford and Squibb have furnished some U-80 material for clinical trial. The protamine zinc insulin U-80 has been found to have the same effect, unit for unit, as the protamine zinc insulin U-40.

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DIFFICULTIES IN THE USE OF PROTAMINE ZINC INSULIN

ELLIOTT P. JOSLIN, M.D.

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The advantages of protamine zinc insulin are so marked that one is loath to lay undue emphasis on difficulties in its use which have been great enough to lead a few patients to return to regular insulin. I have encountered thirty-eight of these and will now briefly describe them, because in general such a return was unnecessary. This is plainly evident because already eight of the thirty-eight have resumed protamine zinc insulin. The temporary omission of protamine zinc insulin was due in five cases to lack of knowledge of its use on the part of the patient, which resulted in reactions and in one case to lack of confidence in it because the preliminary period of instruction had been too short. Another patient gave it up because of a projective trip, quite rightly believing that on a journey long acquaintance with regular insulin would make its employment safer than protamine zinc insulin, with which she had slight experience. The final patient of this group had simply been given protamine zinc insulin in a series of test experiments for which he deliberately came into the hospital.

Experience in the treatment of patients with protamine insulin or, as now employed, protamine zinc insulin certainly does help in transferring patients on regular insulin to protamine zinc insulin. Thus before Oct. 1, 1936, 64 per cent of our patients taking protamine insulin alone or combined with calcium or zinc could be classified as showing either excellent or good results, whereas since October 1 the percentage has

risen to 73. Confidence in the use of protamine zinc insulin on the part of the physician also is an important factor. Now we know from the statistical summaries made that our patients taking protamine zinc insulin or even combined regular and protamine zinc insulin do better than those on the former plan of treatment.

There is no gainsaying the fact that eight patients of the remaining thirty returned to regular insulin because they were convinced that the protamine insulin did not control the diabetes. Such a condition could have been avoided in two instances if the physician had not raised the carbohydrate in the diet during the transfer. These patients had been on a fairly low carbohydrate diet, and so seldom do we use so low carbohydrate values today that thoughtlessly we increased the same too much or too rapidly. The duration of the diabetes in one of these cases was eighteen years, and the other began in childhood and already was over twelve years. Three other persons who were living very useful and active lives and had survived diabetes by fifteen years did not get as good control of the disease with protamine zinc insulin as with regular insulin, even though they tried both protamine and protamine zinc insulin. They had been accustomed to regular insulin in two or three doses and in this manner could live so efficiently and with such freedom from glycosuria or reactions that they felt happier returning to the regular insulin even with its multiple doses. It is my personal belief that if these three patients cared to take the time to learn how to use regular and protamine zinc insulin together, because they undoubtedly would require combined doses, their diabetes would be far better controlled and they could live quite as efficiently. It is true that to do so it would be necessary that the old idea of changing the dosage of insulin from day to day would be replaced with the increase or decrease of diet to attain results. Two of these patients did not feel as well generally, and although they were not showing reactions I suspect that the fact that their blood sugar tests were on a much lower level than on which they had lived for years may have been a factor in this disability. Such patients should be changed to protamine zinc insulin very gradually. Furthermore, physicians and patients too should realize that protamine zinc insulin acts for such a long period that there is no use in altering doses daily, but one should be guided by the result of tests over a period of days.

It is true that with protamine zinc insulin occasionally one has a day of unexplained heavy glycosuria even though apparently conditions are identical. I myself do not believe that the conditions have been identical in such cases but rather that without recognition on the part of the patient more food may have been taken quite honestly, in the second place, less exercise in one form or another or more exercise may have been introduced. Then the insulin may not have been injected in quite the same manner. I grant that such days were not as commonly encountered with regular insulin, but there is no use denying the fact that protamine insulin may not be as uniformly absorbed as the regular insulin. I do not think that this irregularity often occurs, and I have less inclination to think so, because with U-80 protamine zinc insulin the results are quite equivalent to a dose obtained with U-40 insulin and such an action one would not expect if the protamine zinc insulin was absorbed very irregularly.

Habit plays a great factor and involuntarily an intelligent patient learns how to live after fifteen years

of experience with diabetes. For one who suddenly takes up new methods, life cannot be expected to run as smooth a course.

Of this group of eight, one was notable because severe neurologic symptoms occurred following reaction with protamine zinc insulin. Whether these had any connection with the actual reactions I am in doubt, because this patient had had reactions before with regular insulin and they might have been related to these. Furthermore, it is very questionable in my mind whether the neurologic symptoms were not from some other cause. One neurologist interpreted them as multiple sclerosis and another considered that they were part of an organic lesion in the brain. At first we supposed that they were simply manifestations of neuritis so frequent in diabetes and that they had no connection with the reaction. When I last saw the patient a cerebral accident appealed to me most as the etiologic factor for the symptoms, and it is true that in a young man without other cause suspicion falls on the type of insulin which chanced to have been used. No similar instance has been encountered in the 1,250 and more patients taking protamine zinc insulin.

Consideration of the three patients who in the past habitually took liberties with their diet and adjusted their insulin for this purpose calls for a more careful discussion. They found it more difficult to follow such practices with protamine zinc insulin than with regular insulin, although I think they could have done so provided they had added a little regular insulin as a second dose later in the day. Thus Wilder with patients in coma and I with surgical patients and with patients with infectious diseases have used protamine zinc insulin as a basic treatment, and in addition regular insulin has supplemented it depending on the condition of the urine collected at intervals of from four to six hours. Before protamine zinc insulin came in we were accustomed to recommend the fraction according to the result of Benedict's test:

red	orange	yellow	green	blue
20	15	10	5	0

units at the respective intervals of four, six or eight hours. With the use of protamine zinc insulin the figures would drop approximately one half.

The five patients who gave up protamine zinc insulin permanently because of reactions were led to do this largely because of reactions developing during exercise. There is no doubt that with protamine zinc insulin carbohydrate is better utilized and there is less available for use during muscular exertion unless the supply is increased. The patients who are trained first with protamine zinc insulin learn this readily, but other patients who have been habituated to regular insulin have great difficulty in acquiring this knowledge and utilizing it as a routine technic during exercise. Diabetic patients today follow such active lives that I believe that, if there is any tendency in any given patient to a reaction, the patient must be brought up to take carbohydrate between meals and on retiring. It simply will not do for the diabetic patient to develop the reputation that he is liable to become unconscious or to have convulsions at any odd moments.

The type of reaction that the protamine zinc insulin patient endures is distinctly uncomfortable. The headache lasts a long time and is not promptly relieved with carbohydrate. The nausea may be very annoying. There are other reasons than protamine zinc insulin, however, for headache and for nausea and these must be sought before laying the blame on protamine zinc insulin. Nevertheless, it is a fact that the headache is

depleting and that the nausea is dangerous because it confuses the diagnosis with appendicitis and diabetic coma.

The occupations of three patients were of so varied and changing types that today I would hesitate to recommend protamine zinc insulin as the chief basis for their treatment. These were well trained diabetic patients, they had had their disease for years, had worked and labored to secure these special occupations and to their precious jobs they had adjusted their entire lives, years of trial and error had been devoted to this object, and a week or two or even a month or two of trial with protamine zinc insulin could not equal what they had accomplished with years of use of regular insulin.

The remaining ten cases of the series in which protamine zinc insulin was given up can be placed in a miscellaneous group. Again here one encounters two instances in which the intelligence of the patient was not equal to the use of the combined regular and protamine zinc insulin, although with a milder type of diabetes the patients could have been brought up to live on protamine zinc insulin alone. There was another patient, a problem child, and still another with encephalitis and one with unusual edema of doubtful origin. The three patients had been confused because in the early days of protamine insulin we had been obliged to transfer from one preparation to another as new varieties appeared, and in two others we simply did not insist on a long enough period of treatment before discharging the patient.

A hospital stay is not always necessary for a diabetic patient who is to use protamine zinc insulin, but I do think that a hospital stay is very essential if one is to attempt to trade a patient who has lived for years successfully on regular insulin over to the combined regular plus protamine zinc insulin. These patients simply must see others going through the process so as to learn the mistakes that can occur. They think they know all about the management of their diabetes, and it is only by having them under observation, where they can watch others as well as themselves, that one can secure the best results. When I see Mrs. St. C., who for months was compelled to take nearly 500 units of regular insulin daily, now living comfortably on regular insulin 100 units and protamine zinc insulin 300 units, each given before breakfast, it makes me confident that any case needing far smaller quantities of insulin could be adjusted satisfactorily. The patient in question has gained from 87 pounds (39.5 Kg.) up to 111 pounds (50 Kg.). The cause of her insulin resistance need not be discussed here, because eventually a more extensive report will be made, but her case is cited as showing what one can do with protamine zinc insulin and as a hint that other cases far less severe, when the conditions are right, can be managed as well. The number of cases of considerable severity managed satisfactorily on combined regular and protamine zinc insulin almost daily convinces me how satisfactorily protamine zinc insulin can act. Furthermore, the fact that not one patient who has started his treatment with protamine zinc insulin has been changed to regular insulin in the course of twenty-two months is another argument for the efficiency of protamine zinc insulin. Patience, time and the will on the part of both patient and physician to secure the full benefit which protamine zinc insulin can confer in my opinion will surmount any temporary difficulties.

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CLINICAL EXPERIENCE WITH PROTAMINE ZINC INSULIN

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Regular insulin has been used in the treatment of diabetes for about a decade and a half. The great improvement that it brought about in the treatment of diabetes was apparent at once. Its limitations as a substitute for the normal, functioning islands of Langerhans were gradually becoming more apparent during the last half of this time. These limitations were rarely stressed, and probably rightly so, in medical literature until the recent introduction of protamine insulin. A number of reports on the therapeutic results obtained with protamine insulin and with protamine zinc insulin have appeared in the literature. These reports, by necessity, have been made on the basis of a limited number of patients treated over a limited period. The tenor of the reports has, in general, been favorable to the use of protamine insulin and protamine zinc insulin. At present there are insufficient data to warrant detailed statistical analyses of the results of treatment. Nevertheless, sufficient experience has been accumulated to warrant a more critical evaluation of results than was possible a year ago. The present paper will deal with some of the impressions which I have obtained from the use of protamine zinc insulin at the Mayo Clinic. These impressions may have to be revised when subjected to statistical scrutiny.

Our policy at the clinic has been to give one dose of protamine zinc insulin in the morning, before breakfast. When necessary, this is supplemented with a small dose of regular insulin given at the same time. In the more refractory cases an additional dose of regular insulin may have to be given before the evening meal. Most of the burden of keeping the urine sugar free is thus placed on the protamine zinc insulin. This has seemed to be the best method of using the protamine zinc insulin. To date, June 1937, at least 400 patients have been treated in this fashion.

The fact that diabetic patients differ in their response to treatment is frequently overlooked. The cause of this variability is not known. It may possibly indicate that there are different forms of the disease, different etiologic factors, or merely differences in the intensity of the disease. Irrespective of the cause, any judgment on the merits of therapeutic measures should take cognizance of the ease or difficulty with which different diabetic patients can be treated. Failure to realize that such differences exist accounts for many erroneous conclusions regarding therapeutic measures. The classification of patients given in the accompanying tabulation is helpful in anticipating troubles that may arise in treatment.

Occasionally it will be found difficult to classify certain adults on this basis because group I merges rather imperceptibly into group II. It should be emphasized that this classification is based on the age and habitus of the patient at the onset of the disease and not on the actual age of the patient or his habitus at the time of examination. For example, a diabetic patient may be actually 20 years old and still retain most of the characteristics of juvenile diabetes. Likewise the patient

may no longer be obese when first seen by the physician, nevertheless, he should be classified as having diabetes with obesity.

When patients are classified in this fashion generally it will be found that most of the members of the first group will have severe diabetes that is relatively refractory to treatment. In these cases the blood sugar is likely to be unstable, so that glycosuria is difficult to control and insulin reactions readily occur. On the contrary, members of the second group have, as a whole, relatively mild diabetes and fairly stable blood sugars.

At the Mayo Clinic we have treated both groups of patients with protamine zinc insulin. Although, as has been said, insufficient time has elapsed since the introduction of protamine zinc insulin to warrant detailed statistical studies of results, early in our experience it became apparent that the best results were being obtained with members of the second group, namely, the senescent and senile diabetic patients. Fortunately, they greatly exceed in numerical importance the members of the first group. It is precisely these individuals (those of group II) whose disease was easy to control with regular insulin. Relatively small doses of protamine zinc insulin, given once daily to these patients, often suffice to maintain a persistently sugar-free urine.

Classification of Patients

Group I	1 Juvenile
	2 Adolescent and early adult
	3 Adult (to 45 years) (a) Asthenic
Group II	1 Adult (to 45 years) (a) Obese
	2 Senescent and senile (45 years and older) (a) Asthenic
	(b) Obese

Very often supplementary administration of regular insulin is unnecessary and insulin reactions rarely occur. There is no doubt that the use of protamine zinc insulin constitutes almost ideal therapy for this group of patients as far as control of glycosuria and amount of inconvenience to the patient are concerned. How much protamine zinc insulin will do toward prevention of arterial complications remains to be seen.

Our results with patients of group I have not been so encouraging. In fairness, however, it must be said that on the whole results have been equal to, and probably superior to, the results obtained with regular insulin. In treatment of these patients we have been confronted with two major difficulties, namely, irregular control of the glycosuria and severe hypoglycemic reactions. While these patients are under treatment, an appreciable number of them sporadically excrete sugar in fairly large amounts. Sugar suddenly appears in the urine and disappears from it for no apparent reason, and, if sufficient protamine zinc insulin or regular insulin is given to get rid of it, hypoglycemic attacks may occur. Formerly, when these patients were treated with regular insulin, similar fluctuations occurred throughout a period of twenty-four hours. Now, with the use of protamine zinc insulin, the interval between fluctua-

1 Occasionally one finds patients in group I whose diabetes behaves like that of patients in group II and conversely one will find patients in the second group whose diabetes is relatively difficult to control. In the latter instance it generally will be found that the apparent severity of the diabetes is the result of some complication such as hemochromatosis, hyperthyroidism or an obscure infection. The intensity of the initial glycosuria in the absence of such complications is no guide to the fundamental severity of the disease.

tions has been spread out over a longer period of time. Thus, if the urine is tested four times daily a sugar-free urine will be found on several consecutive tests, then often sugar will reappear on one, two or even more examinations. If no change is made in the program, the sugar again may disappear as mysteriously as it appeared. The initial appearance of the sugar frequently is at night or before the evening meal, and it persists until the following morning. If such is the case, additional amounts of regular insulin may have to be taken before the evening meal. When this occurs there is often very little superiority of the protamine zinc insulin over the regular insulin (from the patient's point of view). In spite of the fact that these fluctuations in control do occur, many of the patients say that they feel better when taking the "new" insulin.

The question at once arises whether the irregularity of control is detrimental to the health of the patient. I am not in a position to express any final opinion on this point. It has been realized for a long time that prevention of the degenerative lesions, which are so prone to develop in patients who have diabetes, constitutes the major difficulty in the present day management of the disease. I cannot see that any material progress has been made as far as prophylactic treatment against this phase of the disease is concerned unless protamine zinc insulin, by virtue of its continuous action, should prove to be of some value in this regard. The cause of these degenerative lesions is not known in spite of the vast amount of investigation that has been done and the hypotheses that have been offered. Formidable objections can be raised against all the explanations that have been offered, whether or not they incriminate the blood sugar, the glycosuria, the acidosis, the constituents of the diet or any of the other known factors in the disease. The evidence that the hyperglycemia and the glycosuria, *per se*, are the etiologic factors in arteriosclerosis of diabetes is not at all convincing. Eventually, it may be proved that the sugar in the urine has nothing to do with the matter. There is evidence to suggest that it may hasten the arteriosclerotic processes which have been initiated by other causes. Nevertheless, simply because we cannot achieve a sugar-free urine with the use of protamine zinc insulin, we as physicians are not justified in abandoning our former position that a consistently sugar-free urine is the *sine qua non* in the treatment of diabetes. Eventually we may honestly be able to tell our patients that the sugar which appears in the urine when they are taking protamine zinc insulin does them no harm. Eventually we may point out to them that there is a difference between the urinary sugar that occurs when they are taking protamine zinc insulin and the sugar that appeared when they used to take the regular insulin, because while they are taking the new insulin there is always some functioning insulin in the body whereas when they were taking the old insulin there were often long periods in each twenty-four hours when their bodies were almost entirely without insulin. But are we justified in making such statements at present? I do not believe that we are.

In treatment of the same group of patients (those of group I), serious insulin reactions occurred when regular insulin was used. These patients were the tight-rope walkers who had brittle blood sugars and who alternated between bouts of glycosuria and attacks of hypoglycemia. The use of protamine zinc insulin has mitigated this undesirable situation, but by no means has it been eliminated. Some of the insulin reactions

following the use of protamine zinc insulin have been peculiarly malignant in that they have occurred at times when the patient could not possibly believe that his initial warning symptoms were hypoglycemic in origin, nor could the attending physician believe that the subsequent symptoms were due to the same cause. In a few instances, because of the prolonged action of the protamine zinc insulin, the hypoglycemic attacks have recurred in waves. Temporary relief followed recognition and treatment of the initial symptoms but the relief did not persist. The experience of one of our patients is particularly instructive.

A man had been getting along well on 22 units of protamine zinc insulin taken in a single dose in the morning. January 22 he took a business trip in his automobile and, because he could not get his usual diet en route, he ate very little for his noon and evening meals. The following morning the urine was sugar free. He did not feel like eating all of his breakfast but he took his usual dose of protamine zinc insulin. About 9 o'clock he began to tremble and shake like a leaf and at the same time he was seized with a violent abdominal pain which was followed by nausea and vomiting. He was taken to a hospital in a neighboring town where his condition was promptly recognized as an insulin reaction. The concentration of blood sugar was found to be 41 mg for each hundred cubic centimeters. He was given orange juice and syrup. In about an hour he felt normal again. He took nothing further by mouth that day. About midnight he again experienced severe abdominal pain, nausea, vomiting and trembling. Several doses of orange juice at intervals of half an hour had to be given before he obtained relief. By noon the following day he again felt well and was able to eat his noon meal. On this day he took no insulin. January 25 his symptoms again recurred and the concentration of blood sugar was found to be 49 mg for each hundred cubic centimeters. At this time he was given dextrose solution intravenously and 20 units of protamine zinc insulin. In two or three hours he felt normal again and the blood sugar was found to be 90 mg, but later in the day the symptoms again recurred. He does not remember whether he was given additional dextrose or what the intake of food was. At 4 a.m., January 26 his symptoms again returned and again he had to be given dextrose solution intravenously. He was then transferred to another hospital in a larger town. He had no further abdominal pain or vomiting. Roentgenologic examination disclosed the presence of gallstones.

The issues in this case are somewhat confused, and it is impossible to state what proportion of the trouble was due to the gallstones. There seems to be no doubt that the initial symptoms were hypoglycemic in origin, although it is possible that the later hypoglycemic episodes and abdominal pain were partly or wholly the result of disease of the biliary tract and hepatic dysfunction. Nevertheless, this case illustrates the treacherous character of hypoglycemic shock as it may occur following use of protamine zinc insulin. Bollman, who has been studying the effects of overdosage of protamine zinc insulin on experimental animals, says that nausea and vomiting occur regularly in dogs during the hypoglycemic periods.

It should be emphasized that hypoglycemia following administration of either protamine zinc insulin or regular insulin may be entirely without symptoms. Thus, one of our diabetic patients, during his convalescence from a surgical procedure, was accidentally found to have concentrations of blood sugar which varied from 28 to 42 mg for each hundred cubic centimeters. This patient, lying quietly in bed, said that he felt fine, and the blood sugar was determined only because the urine had been persistently sugar free for several consecutive days. It is quite possible that this patient would have

had a severe hypoglycemic reaction had he been ambulatory. It is not wise to dismiss from observation diabetic patients who have been taking protamine zinc insulin if the urine contains no sugar unless the range of the blood sugar is determined.

Before the subject of hypoglycemia is dismissed, attention should be called to the fact that there is clinical and experimental evidence to suggest that severe

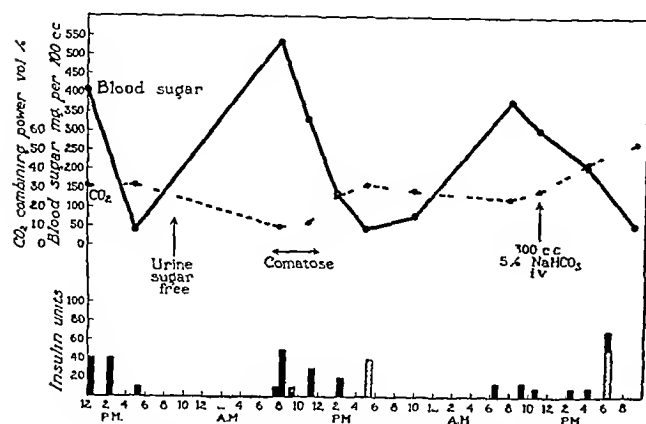


Chart 1—Details of management of a case of diabetic acidosis in which no protamine zinc insulin was used at the beginning of treatment. Note that in spite of a low blood sugar and a sugar free urine six hours after admission there was a complete 'escape from control' during the following night. Solid black columns regular insulin diagonal striped columns protamine zinc insulin.

hypoglycemic attacks may produce permanent pathologic changes in the central nervous system. In this connection it is significant that one of our patients who was subject to recurring insulin reactions while taking protamine zinc insulin was returned to the hospital because of the appearance of defects of memory.

It should not be inferred from what has been said that protamine zinc insulin is not equal to, or that in many instances it is not superior to, regular insulin in the management of severe diabetes. Most of the difficulties that have just been mentioned existed in one form or another with regular insulin, however, in many instances, except for the convenience of a reduced number of injections and the hypothetical protection offered against development of degenerative lesions, I cannot see that the use of protamine zinc insulin has altered the fundamental problems in connection with the management of severe diabetes. In such cases it has not simplified treatment nor has it by any means eliminated all the problems in management. In fact, I find that it is harder to treat some patients who have severe diabetes with protamine zinc insulin than with regular insulin if a persistently sugar-free urine is to be attained. In spite of the difficulties in management that are encountered in the treatment of severe diabetes, many patients, as mentioned before, say that they feel better taking protamine zinc insulin than they did while taking regular insulin. This is by no means always the case. In fact, two of our student dietitians who have severe diabetes asked to be returned to the use of regular insulin. Both of these young women have difficulty in avoiding disabling insulin reactions if the urine is kept anywhere near sugar free. A letter from a former patient summarizes the difficulties that may occur in the management of very severe cases.

The main purpose of this letter is to tell you I tried the new insulin at Christmas time under Doctor —'s care. I stayed with him for nearly six weeks, spending ten days in the

hospital trying it out. But we had very poor results. I seemed to get in rather bad shape, lost 20 pounds, and found it upset my whole system. We tried it one, two and three doses a day, alone and in combination with the old insulin but I never came clear for the whole six weeks for any length of time and yet had very severe reactions when it would take three and four hours to bring me out of them. After these reactions I would vomit and altogether it was a most unsatisfactory affair. And so I guess I'm still running true to form. Both Doctor — and I were disappointed because we felt, since you advised the use of it for me, it would be of help to me. My father uses 15 units of it in the morning and it certainly works marvelously for him.

It could be argued that in this case the physician had not had the opportunity to develop the same expertness in the use of protamine zinc insulin which he had acquired in the use of regular insulin, and that possibly with a longer trial and more finesse in treatment a satisfactory program which included protamine zinc insulin could have been evolved. Nevertheless, this case, admittedly exceptional, does illustrate the difficulties that may be encountered in the treatment of severe diabetes with protamine zinc insulin.

In the preoperative and postoperative treatment of diabetic patients who have surgical complications and in the treatment of diabetic acidosis, protamine zinc insulin has proved to be of value. Situations not infrequently arise in which, although the immediate use of insulin will be contraindicated, the status of the patient will be such that several hours later the immediate use of insulin will be imperative. For example, the urine of one of our surgical patients who had severe diabetes was sugar free at 10 p.m. Six hours later well marked diabetic acidosis had developed. In situations of this kind protamine zinc insulin can be used to marked advantage. For example, diabetic patients prior to an operation may have a normal concentration of blood sugar so that one would hesitate to give a dose of regu-

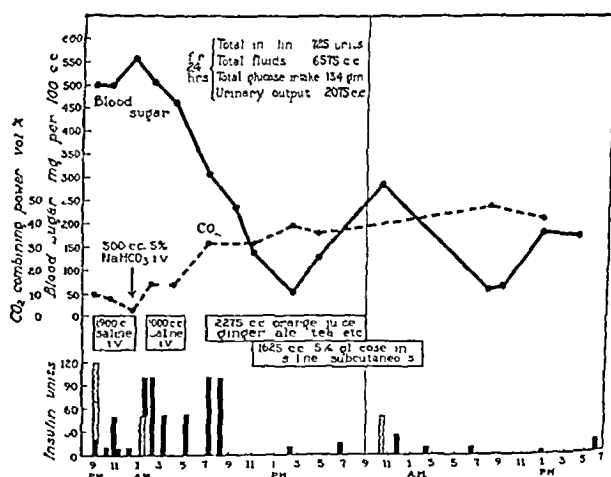


Chart 2—Details of management of a case of diabetic acidosis in which 50 units of protamine zinc insulin was injected at the beginning of treatment. Although only 25 units of regular insulin was used during the second twelve hours after admission there was no 'escape from control' in this period. Solid black columns regular insulin stippled columns protamine zinc insulin intravenously diagonally striped column protamine zinc insulin.

lar insulin. Several hours later the need for insulin may be urgent. Protamine zinc insulin can be given with comparative safety prior to the operation, for by the time the protamine zinc insulin begins to work the need for it will have arisen. The policy at the Mayo Clinic at present is to give from one half to two thirds

of the usual dose of protamine zinc insulin on the morning of the operation. If the patient has been taking regular insulin as well, the regular insulin is omitted or the dosage is greatly reduced. Any glycosuria that may appear after the operation is treated with regular insulin. The daily use of protamine zinc insulin supplemented, if necessary, with regular insulin is continued throughout the postoperative period until the patient is back on his usual diet and dosage of insulin. When this program is followed, there is very little danger that the disease will get out of hand during the immediate postoperative period, although, following tonsillectomy in two of our cases of severe diabetes in which treatment was with the foregoing preoperative and postoperative program, severe acidosis and incipient coma developed.

For some time after the introduction of protamine zinc insulin it was felt that its use was contraindicated in the treatment of diabetic acidosis and coma. Further experience has shown that it can be used to advantage in these conditions. Our present policy at the Mayo Clinic is to give all such patients a large dose of protamine zinc insulin and then to proceed with treatment as though no insulin had been given. Very often, in the treatment of diabetic acidosis and coma, there comes a period when it is exceedingly difficult to decide how vigorously further treatment should be pursued. The patient has made a satisfactory response to the treatment that has been given and for the moment further insulin may not be necessary, yet the patient is still in a delicately balanced condition and the need for insulin is certain to arise in the near future. If further insulin is not given, the consequences may be serious. It occurred to us that, because of its prolonged and rather gentle action, protamine zinc insulin would be useful in timing the patient over this period of indecision. Charts 1 and 2² illustrate the advantages of protamine zinc insulin in such situations. It is inadvisable to rely entirely on protamine zinc insulin in the treatment of diabetic coma. Frequently in this complication of diabetes every moment counts and the quicker the metabolic disturbance is controlled the better is the chance for recovery.

SUMMARY

Protamine zinc insulin has facilitated treatment in many cases of diabetes, especially those in which the disease was of moderate severity. In this group of cases the disease usually responds satisfactorily to regular insulin. Earlier and more severe cases of diabetes, in which the blood sugar is unstable, are still a problem in treatment. In these cases nocturnal glycosuria can be eliminated with protamine zinc insulin, but control of the diurnal glycosuria is still very difficult to achieve if violent hypoglycemic episodes are to be avoided. Many of these patients feel better while taking protamine zinc insulin than they did while taking regular insulin, even though glycosuria is present during the day. Is such glycosuria detrimental to health? Until the cause of arteriosclerosis and the allied degenerative lesions which occur in diabetic patients has been determined beyond any reasonable doubt, we are not justified in assuming that such glycosuria is not detrimental to health.

Protamine zinc insulin also has proved to be of value as an adjunct in the treatment of diabetic acidosis and coma and in the preoperative and postoperative management of diabetic patients who have surgical diseases.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRs MOSENTHAL, JOSLIN AND KEPLER

DR WALTER R CAMPBELL, Toronto. It is appropriate here to pay our tribute to pure biochemistry. First prepared by Miescher in 1874, intensively studied by Kossel about the turn of the century, the protamines could scarcely be regarded as of any clinical importance until Hagedorn utilized their property of combining with the higher proteins to prolong the action of insulin. The relationship of another constituent of the pancreas, zinc, to insulin has been the subject of study by Scott and his co-workers. Scott has shown that zinc is one of the necessary constituents of insulin crystals, that it increases the effectiveness of insulin and that the relative effectiveness of protamine insulin is dependent in large degree on the presence of adequate amounts of zinc. In addition, he has shown that certain basic amines, histones and several other substances, in combination with zinc, will enhance the effectiveness of insulin. Failure to appreciate the fact that the chemical and physical properties of the insulin determine its physiologic efficiency has been the chief cause of relative inefficiency in treatment with the newer insulins. With time, by persistent trial and adequate study, a solution can be found for every case of diabetes. In difficult cases it is clear that the best solution is not unmodified insulin alone. Neither can one stretch the properties of protamine zinc insulin to cover all cases, even when it is supplemented by all the dietetic tricks at one's command. There is a use for the properties of unmodified insulin, for zinc insulin, for protamine insulin, and for protamine zinc insulin. These are all specialist insulins. Today a general practitioner insulin is needed to cover even more adequately the requirements of the majority of patients with diabetes—one combining in suitable proportions the useful properties of the two varieties that now represent the extremes. Ambulant patients can be well treated with protamine zinc insulin. Because of added factors, such as work, hospital patients must often have readjustment of dosage after discharge. Younger patients frequently require combinations of protamine zinc insulin and regular insulin. The expenditure of protamine zinc insulin is dependent on the diet used. The lower the carbohydrate in the diet, the greater the economy observed. Emergencies are best treated with the unmodified insulin. Failure of the circulation is the danger of waiting too long for protamine zinc insulin to act. Dr Kepler has rightly stressed the fact that treatment is not simplified by the introduction of the new insulins. Both patient and doctor must know more, but the judicious application of what they know materially improves the patient's condition and prospects.

DR CARL H GREENE, New York. I think it is agreed that the average diabetic patient, particularly if his case is severe, has welcomed the new product because it greatly simplifies the control of his disease. The physician, however, finds that the treatment of diabetes, as contrasted with control of the individual patient, has been complicated by the introduction of another variable to an already complicated equation. Generalizations are dangerous and I appreciate the fallacies inherent therein. One may sum up the situation, however, by saying that on the one hand mild diabetes with a low fasting blood sugar may be controlled by regulation of the diet and administration of sufficient regular insulin to prevent postprandial hyperglycemia. Severe diabetes, on the other hand, with elevated fasting blood sugar, is to be controlled by the administration of sufficient protamine zinc insulin to maintain the blood sugar at a normal or slightly subnormal level, while the diet is adjusted to prevent the development of a hypoglycemia. Protamine zinc insulin is most satisfactory in that it permits the handling of the average patient as an ambulatory or office patient rather than one who must be hospitalized. Because of the possibility of making observations and adjustments at short intervals, the patient in acute coma is best treated with regular insulin, but when it has not been possible to make observations at short intervals protamine zinc insulin should be used in addition to the regular insulin in the treatment of coma. Likewise in the management of infections, pregnancy and labor, and in operations, protamine zinc insulin has made it possible to carry the patients along without the necessity for frequent or hourly observation to prevent the development of

² Reports of these two cases are given in detail in the Proceedings of the Staff Meetings of the Mayo Clinic 12: 171-176 (March 17) 1937.

coma. The question of time of dosage depends somewhat on the character of the patient. An individual who is unable to space his meals through the day or likes the old-fashioned heavy breakfast seems to get better results when taking protamine zinc insulin before going to bed at night, rather than the first thing in the morning. Many patients are not satisfactorily controlled on protamine zinc insulin alone, but giving protamine zinc insulin in the morning, making supper the major meal of the day and the giving of a small amount of regular insulin at that time suffice for control. While the care of the individual patient is simplified, the possibilities of protamine zinc insulin further emphasize the importance of individualization and intensive care and study in the adjustment of the physical and dietary regimen and the kind and dosage of insulin to the needs of the particular patient.

DR ABRAHAM RUDY, Boston. I would like to mention a case similar to Dr. Carl Greene's. A physician aged 47 has been doing well on about 40 units of regular insulin divided into two doses. When this was gradually changed to the same amount of protamine zinc insulin given once a day without any change in his diet he continued to do well for about two months. Without any apparent cause, his carbohydrate tolerance began to drop. A marked increase in the protamine zinc insulin was not sufficient to control his condition and it was necessary to add regular insulin. In spite of the fact that he was already taking 56 units of protamine zinc insulin with 24 units of regular insulin in the morning, 20 units of regular insulin before lunch and 12 units before supper, he continued to feel poorly and was losing weight steadily. He then insisted that I should change him back to the regular insulin alone. As soon as the protamine zinc insulin was omitted he immediately began to show improvement. The glycosuria and hyperglycemia cleared up in a few days. He was soon taking only 16, 16 and 12 units of regular insulin daily on the same diet, gained about 5 pounds (2.3 Kg) and was doing well. A point of interest is that this patient has developed nodules at the site of the injections of the protamine zinc insulin. He counted as many as sixteen nodules in one day. These cleared up very slowly. With the change of the U-40 protamine zinc insulin to U-80, the nodules were smaller but the action of the insulin was the same. I also find nausea and vomiting fairly frequent as a sign of reactions from protamine zinc insulin. This is quite disturbing in the treatment. Otherwise the results with protamine zinc insulin are excellent in most cases.

DR HERMAN O. MOSENTHAL, New York. One point I might add is with regard to the local reactions that some patients have with protamine zinc insulin and regular insulin. In one case these reactions were quite severe. Finally, after many trials, I remedied the situation by using a five-eighths to six-eighths inch needle instead of the usual three-eighths inch one and injecting the material as deeply as possible. The protamine zinc insulin under those circumstances was just as effective as though given subcutaneously.

DR ELLIOTT P. JOSLIN, Boston. To begin ambulatory patients with protamine zinc insulin is a snap, but to change patients, especially if ambulatory, who have long been accustomed to regular insulin over to protamine zinc insulin is serious. In general it is better to send them to the hospital. If you have tried to change over such a patient, who has been on regular insulin, your reputation is apt to suffer, if it is done outside of a hospital. In the first place, you must have that patient under your control and his family and his wife and his relatives, because if you make a failure, about how many people will there be in your town who won't know it? The next rule is this: Always, before changing over a patient who has been taking regular insulin to protamine zinc insulin, have a period of at least three days' preliminary observation. That is most desirable in order to have a period for comparison. Finally, never urge protamine zinc insulin on a patient. Wait for him to ask for it and then say "It is a privilege to take protamine zinc insulin. If you wish I will help you to learn whether it will act better than regular insulin in your case." How long should a patient persist taking protamine zinc insulin before returning to regular insulin? A two months test is a liberal allowance, provided you actually know what your patient is

eating and doing and furthermore have reliable laboratory data. In a letter from Dr. Himsworth from London I learned that he had obtained very good results indeed by giving protamine zinc insulin at 11 o'clock at night. I haven't tried that, but it is something to be considered. In other words, we do not have the last word yet about the way to give protamine zinc insulin.

THE PROBLEM OF SERORESISTANT SYPHILIS

(SO-CALLED WASSERMANN FASTNESS)

JOSEPH EARLE MOORE, MD

AND

PAUL PADGET, MD

BALTIMORE

Few things in syphilotherapy are more disconcerting, both to physician and to patient, than the persistence of a positive serologic reaction after the administration of an amount of treatment which to the former was recommended as adequate and which to the latter has seemed of interminable length and the source of immeasurable inconvenience and expense. The physician confronted with this situation may doubt the validity of the dicta of experts which he has been following and begin to tinker with different schemes of treatment or even with untried therapeutic agents, the patient, deprived of this much emphasized and to him always tangible evidence of improvement, may become discouraged and abandon treatment or fall into the hands of quacks. For these reasons an examination of the subject of seroresistant syphilis seems more than justified.

There is no generally accepted definition of seroresistance (so-called Wassermann fastness), but most observers agree that the concept should be based on an arbitrarily chosen span of time or amount of treatment and that a distinction should be drawn between patients with early syphilis and those late in the course of the disease. Accordingly, in this discussion, patients with early syphilis (i.e., infection of less than two years' duration) are considered to be seroresistant if the result of the serologic test for syphilis remains positive after six months of continuous treatment, whereas those who present themselves late (i.e., after having been infected with syphilis for more than two years) are considered to manifest seroresistance only if the result of the reaction to the serologic test for syphilis is positive after the equivalent of a year of treatment.

Numerous problems are presented by the patient with seroresistant syphilis, but they can be summarized in three large questions:

- 1 What is the genesis of seroresistance?
- 2 What is the significance of seroresistance to the patient?
- 3 What is to be done about it?

GENESIS OF SERORESISTANCE

It is axiomatic that the number of positive results obtained from serologic tests on a large number of patients with syphilis is a direct measure of the sensitivity of the test employed. The influence of this

From the Syphilis Division of the Medical Clinic, Johns Hopkins Hospital.

Read before the Section on Dermatology at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1937.

No consideration is here given to the persistence of serologic abnormalities in the cerebrospinal fluid. That is a separate problem.

factor in the production of seroresistance is well illustrated in chart 1, in which it is shown that of 100 patients who manifested seroresistance as measured by the best tests of today, only seventy would have done so as judged by the best test of 1920 and only twenty-eight would have given a positive reaction with von Wassermann's original technic

The fundamental biologic aspects of the disease also operate. In this connection the following questions are important. Does seroresistance indicate persistent foci of spirochetes or progressive syphilitic lesions? or Is the persistence of reagin in the circulating blood following antisyphilitic therapy simply a manifestation of persistent immunity?

No certain answer to these questions is possible because of lack of definitive evidence, either clinical or experimental, but available information indicates that while either or both factors may operate in the individual case, a few generalizations are possible. Here, as elsewhere, it is necessary to differentiate between early and late syphilis. In the interest of the patient, seroresistance in cases of early syphilis must, on the basis of present knowledge, be regarded as a manifestation of persistent foci of organisms or progressive activity. In cases of late syphilis, on the contrary, seroresistance may result entirely from the persistence of well established immunity.

A little emphasized point is the influence of the type of syphilitic infection at the beginning of treatment on the development of seroresistance. This is illustrated in chart 2, in which it is shown that in the various groups the incidence of seroresistance varies from

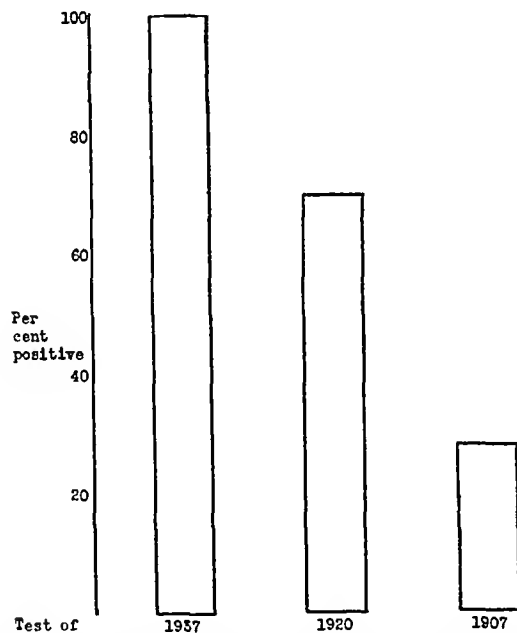


Chart 1—The influence of the type of serologic test employed on the incidence of seroresistance. (Based on data from Eagle Harry. The Laboratory Diagnosis of Syphilis. St. Louis: C. V. Mosby Company, 1937.)

about 10 per cent in patients with early syphilis to approximately 75 per cent in those who first come under treatment with dementia paralytica.

In cases of early syphilis, two other factors are of extreme importance in determining the incidence of seroresistance, first, the system of treatment employed and second, the presence or absence of involvement of

the nervous system. The influence of the former is shown in chart 3, only 11 per cent of patients who receive continuous treatment are seroresistant but 37 per cent of those treated intermittently and 68 per cent of those whose therapy is irregular give positive reactions to serologic tests more than six months after the institution of treatment.

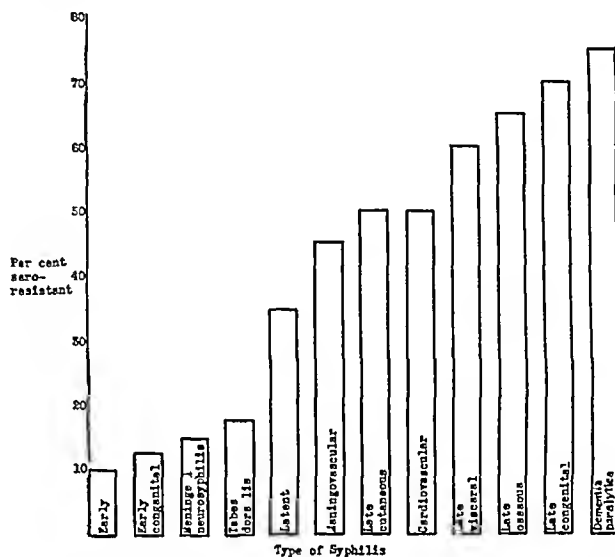


Chart 2—Influence of the type of syphilis at the time treatment was begun on the incidence of serologic resistance. All groups of patients were well treated. (From data of the Cooperative Clinical Group.)

The relationship between the presence or absence of involvement of the nervous system and the development of seroresistance is equally striking (chart 4). The influence of all other factors being disregarded, seroresistance is encountered in only a sixth of the patients whose cerebrospinal fluid is normal or falls into group Ia² but occurs in almost a fourth of those whose cerebrospinal fluid is of group Ib and in almost half of those manifesting changes typical of group II or group III.

In patients with late syphilis, however, the situation is entirely different. As shown in chart 2, seroresistance is a usual or expected eventuality with many forms of late syphilis. Studies from the Medical Clinic of the Johns Hopkins Hospital³ and material from the Cooperative Clinical Group⁴ have shown that the incidence of seroresistance is not influenced by the scheme of treatment employed or related to the existence of involvement of the nervous system per se. Instead it may be viewed as an integral part of the manifestations of many late forms of the disease.

It is to be emphasized that the foregoing data concern patients who receive adequate antisyphilitic therapy or if their treatment is irregular or intermittent receive adequate doses when treatment is given. There is no information which allows a clear evaluation of the

² The usual classification of changes in the cerebrospinal fluid is employed: group Ia 6 cells or more all other observations normal; group Ib 5 cells or more protein increased no other abnormalities; group II reaction to complement fixation or other standard serologic test for syphilis positive with larger amounts of fluid (from 0.4 to 1 cc) the results of other examinations variable; group III (the parietic formula) reaction to complement fixation or other standard test positive with 0.1 cc or less of cerebrospinal fluid; a parietic colloidal curve.

³ Wasserman, Harry, and Goodman, Morton J. The Results of Treatment in Late Mucocutaneous and Osseous (Benign Late) Syphilis. *Am J Syph & Neurol* 18: 458 (Oct.) 1934. Smith, F. R. Jr. Late Congenital Syphilis. *Bull Johns Hopkins Hosp* 53: 231 (Nov.) 1933.

⁴ Moore, J. E., Cole, H. N., O'Leary, P. A., Stoles, J. H., Wile, U. J., Clark, Talarferro, Parran, Thomas, Jr., and Usilton, Lida. J. Cooperative Clinical Studies in the Treatment of Syphilis. The Treatment of Latent Syphilis. III. Clinical Progression and Relapse. *Wassermann Fastness and Death Ven Dis Inform* 13: 389 (Nov. 20) 1932.

effect of treatment with inadequate doses of drug on the course of either early or late syphilis. From theoretical considerations and from deductions based on clinical observation, however, it seems probable that inadequate doses, even given according to a system of continuous treatment, are a potent factor in the production of seroresistance.

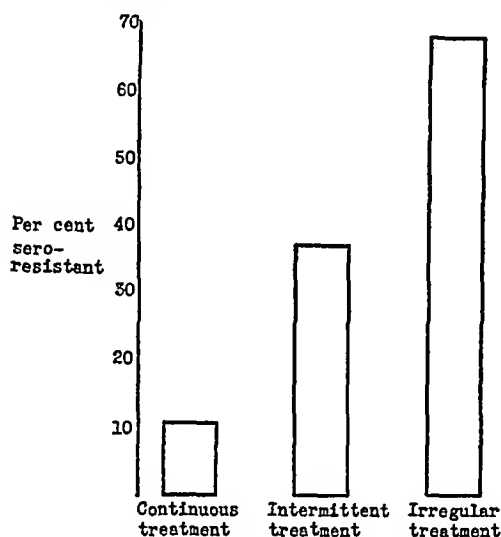


Chart 3—Relationship between the system of treatment employed and the incidence of seroresistance in patients with early syphilis (From data of the Cooperative Clinical Group)

SIGNIFICANCE OF SERORESISTANCE

The all important question both to the physician and to the patient is "What is the significance of seroresistance?" Here again early and late syphilis must be considered separately.

The relationship between seroresistance and the presence or development of the two most important failures of treatment in cases of early syphilis is shown in chart 5. All patients considered had received adequate antisyphilitic therapy. Twenty-three per cent of the seroresistant group, but only 5 per cent of the patients who manifested prompt serologic reversal, sustained infectious relapse, similarly neurosyphilis occurred in 31 per cent of the former but in only 18 per cent of the latter.

The contrasting situation which obtains in patients with late syphilis is shown in chart 6. For each type of late syphilis considered, the incidence of progression or relapse is essentially the same among patients who are seroresistant as among those who are not, indeed, in the case of latent or benign late syphilis, relapse occurs somewhat more frequently in patients who are not seroresistant than in those who are. Progression or relapse developed in 46 per cent of the patients with latent syphilis who were seroresistant and in 57 per cent of those who were not, in the case of benign late syphilis one of these eventualities developed in 98 per cent of the seroresistant group and in 122 per cent of the patients who had experienced serologic reversal. In the group with late congenital syphilis, 21.5 per cent of the patients who were seroresistant and 20 per cent of those who were not later manifested progression of the disease. In patients with these types of late syphilis, therefore, seroresistance may actually be beneficial rather than harmful.

In patients with other forms of late syphilis, especially cardiovascular syphilis or neurosyphilis, sero-

resistance is so common that the impossibility of placing special interpretation on its occurrence is readily apparent.

MANAGEMENT OF SERORESISTANT SYPHILIS

The preceding discussion has merely provided a background of necessary information for an intelligent consideration of the crux of the entire problem "What is to be done for the patient who manifests seroresistance?"

Before answering this question in detail, it is essential to reemphasize the aims of the treatment of syphilis, early or late. These are (1) the healing of lesions and the relief of symptoms, (2) the maintenance of good health and the prevention of progression or relapse and (3) least important, serologic reversal. Obviously, if the first and second aims can be accomplished, success or failure in the third is, or should be, a matter of complete indifference to physician and patient alike. If the patient can be restored to health and kept so for a lifetime, seroresistance may be regarded as entirely analogous to the persistence of a positive reaction to the tuberculin test in a patient recovered from tuberculosis or a positive reaction to the Widal test in one recovered from typhoid fever. Efforts to abolish a persistently positive reaction to the tuberculin test or a positive reaction to the Widal test are agreed to be both unnecessary and futile.

It is easy to tell when the first aim of treatment, the healing of lesions and the relief of symptoms, is accomplished. In most patients this can be done within a few days or weeks and is not necessarily accompanied by any change in the serologic test. How can one tell when

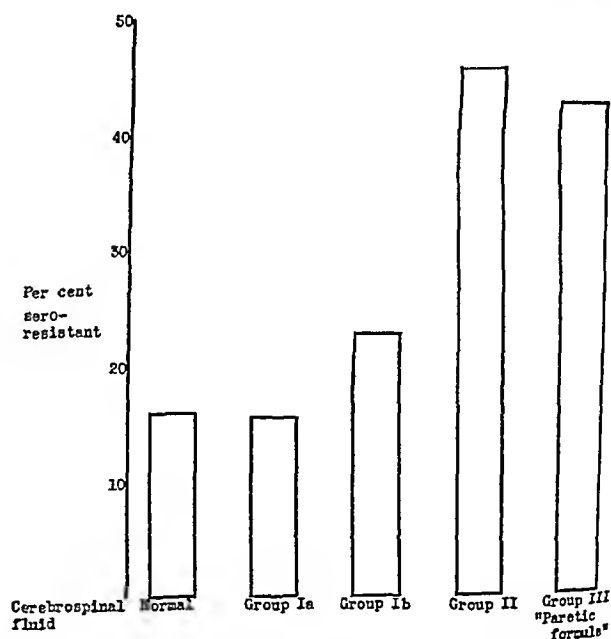


Chart 4—Relationship between the changes in the cerebrospinal fluid and the incidence of seroresistance in patients with early syphilis irrespective of the type and amount of treatment (From data of the Cooperative Clinical Group)

the second aim, the maintenance of good health and the maximum possible freedom from progression or relapse, has been obtained? Can this be measured by serologic reversal or serologic fastness? In patients with early syphilis, probably yes, and here serologic control of treatment is desirable, serologic reversal to be sought and seroresistance to be feared. In patients with late syphilis, certainly no. The patient's ultimate

clinical fate cannot be measured in any degree by what happens to his blood test. The only possible criterion for determination of the optimum kind, amount and duration of treatment is the long term clinical observation of large series of similar patients given varying kinds and amounts of treatment for varying periods of time. Such observation indicates, as has been

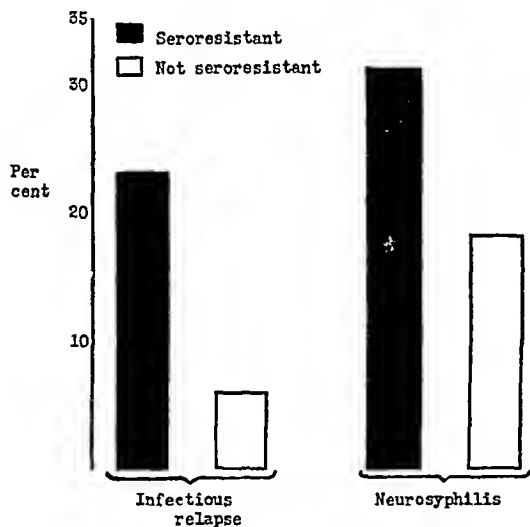


Chart 5—Relationship between seroresistance and failure of treatment in patients with early syphilis

pointed out, that the seroresistant patient, adequately treated, does as well as, or even better than, his supposedly more fortunate brother with serologic reversal. Considered in this light, the serologic control (so far as blood tests are concerned⁵) of treatment in cases of late syphilis is unnecessary, even undesirable, and seroresistance loses its fearsome significance.

The Management of Seroresistant Syphilis

In Patients with Early Syphilis

- I Examine the cerebrospinal fluid
 - A If reaction is positive Alter system of treatment to that for early asymptomatic neurosyphilis
 - B If reaction is negative
 - 1 Eliminate rest periods—treatment must be continuous
 - 2 Employ full dosage of a potent arsphenamine
 - 3 Prolong treatment for a full year of weekly injections after serologic reversal is obtained

In Patients with Late Syphilis

- I Examine the cerebrospinal fluid
- II Conduct a searching clinical study for lesions of syphilis with particular reference to
 - A The cardiovascular system (including roentgenologic examination)
 - B The central nervous system
 - C The bones
- III If abnormalities in any of these systems are discovered plan treatment accordingly
- IV If no abnormalities are discovered
 - A Prolong treatment to a minimum of two years continuously and with full doses
 - B Follow the patient for the rest of his life with periodically complete and searching surveys of his clinical status
 - C Frankly discuss and fully explain the situation to the patient and give him as much reassurance as possible

In the accompanying table are summarized the steps which must be taken in the treatment of seroresistant patients with early or late syphilis.

In patients with early syphilis the high correlation between seroresistance and involvement of the nervous

makes it imperative immediately to examine the cerebrospinal fluid of every seroresistant patient or to reinvestigate it if the results of a previous examination were normal. If the cerebrospinal fluid is normal, further continuous intensive treatment will result in serologic reversal almost uniformly within a year, and the same system of treatment should be continued for a full year after serologic reversal has occurred.

In patients with late syphilis the ever present necessity for examination of the cerebrospinal fluid and repeated diligent clinical and roentgenologic search for lesions of syphilis, especially in the cardiovascular, skeletal and central nervous systems, is made even more urgent by the manifestation of seroresistance. If lesions caused by syphilis are found, the system of treatment is, of course, to be planned accordingly (e.g., in cases of cardiovascular syphilis or neurosyphilis), if, however, careful study discloses no demonstrable abnormalities (i.e., if the patient truly has latent or healed benign late syphilis), no departure from the usual system of continuous, intensive treatment is required.

The employment of special measures for the treatment of such patients is neither necessary nor desirable. "High pressure" intensification of treatment by the use of unusually large doses or short intervals is not necessary because it subjects the patient to an increased risk of reactions to treatment without the offset of an improvement in prognosis. "Drug shopping" is inadvisable except in a few instances which require individualized expert judgment. Finally, and particularly to be condemned as unproved and unnecessary and as imposing an unjustified risk on the patient, are

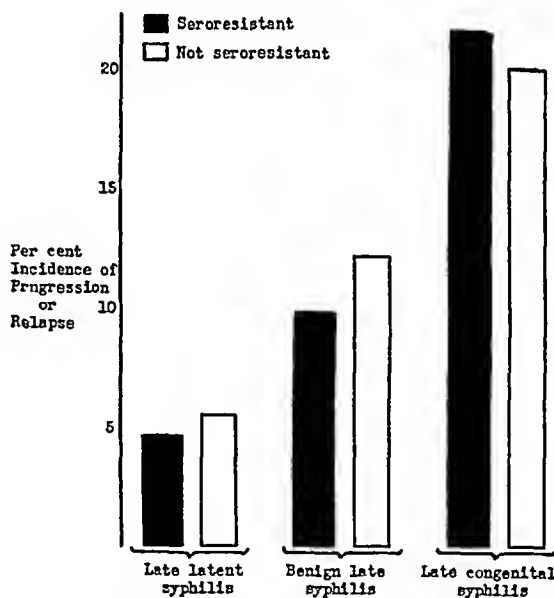


Chart 6—Lack of relationship between seroresistance and the incidence of progression or relapse in patients with various forms of neurosyphilis (From data of the Cooperative Clinical Group Goodman and Wasserman and Smith)

efforts at reducing a positive reaction to the serologic test for syphilis to negative by nonspecific methods, especially artificially induced fever. The prolongation of the usual system of continuous treatment to two full years with the additional safeguard to the patient of periodic observation for the rest of his life, will accomplish the desired result of maintenance of good health in the vast majority (probably 95 per cent) of patients with seroresistant late syphilis.

⁵ The control of treatment of neurosyphilis by repeated examination of the spinal fluid it is again emphasized is excluded from this consideration.

MANAGEMENT OF THE PATIENT

In these days of great publicizing of syphilis to the public, the practitioner charged with the care of a patient with seroresistant syphilis may find the actual administration of treatment much less troublesome than the necessity for assuaging the fears and foibles of the partly informed and anxious patient. To him the persistence of a positive reaction to the serologic test is most disconcerting, especially if he came under treatment with no lesions but only the positive reaction to the serologic test, accidentally discovered. No generalizations for procedure under these circumstances are possible, but according to our experience the best results are obtained by as complete a discussion of the situation as the information and grasp of the patient will allow, with large amounts of reassurance.

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ABSTRACT OF DISCUSSION

DR JOHN G. HOPKINS, New York. What is a positive Wassermann reaction? What causes a positive Wassermann reaction? Does a positive Wassermann reaction mean the existence of spirochetes? Without knowledge of the true answers to those questions it is extremely difficult to rationalize our advice and treatment of the patient with a persistently positive Wassermann reaction. Granted that it is said that it is best to assume that a positive Wassermann reaction means persistence of spirochetes, it is well known that they may be persistent in the presence of a negative Wassermann reaction. I don't know of any more distressing problem than the patient who comes with one of these persistent positive Wassermann reactions. Even if one arrives at the conclusion that at least so far as the latent syphilitic patient is concerned he is in no worse and possibly is in a better condition than the patient with the negative Wassermann reaction, that does not relieve his psychic trauma. I think the two most significant charts, the most interesting of all that the authors presented were the two which showed the frequency of later relapse in early patients with persistent seroreactions, and in late patients with persistent seroreactions. I had never realized there was that contrast between the two groups. There are two questions that I should like to raise with regard to the management of these cases. One is, Do the authors advise anything in the way of chronic treatment? It has long been a practice—I can't believe that it is purely personal—in such cases to advise something like one course of a mercurial treatment a year, or one course of bismuth treatment a year, or something else, over a long period, with the idea that one might prevent a later relapse. Do their studies show whether any sort of prolonged intermittent therapy does really give any protection or conceivably does it perhaps increase the possibility of further relapse? The other question is this. Assuming that a positive Wassermann reaction means syphilis in the absence of other signs, and that the reaction becomes negative under treatment, according to these figures the patient's chances of future trouble are a little greater than those of the man whose reaction remained positive. Now, are there any real figures as to the value of this treatment of patients with entirely latent syphilis? Does one really accomplish anything? That is the question on my mind, and I should like to know whether there are any figures on it.

DR PAUL A. O'LEARY, Rochester, Minn. There is one feature of latency that the authors did not discuss—that is, the significance of the age factor, the age of the patient and the 'age' of the syphilis. The duration of the syphilis is of prime importance in interpreting the significance of latent syphilis in a given case. As Drs. Moore and Padget said, early latency has an entirely different significance than does late latency. For example, a young patient who has had syphilis for four or six years and who is manifesting latent syphilis, with a positive blood Wassermann reaction, the spinal fluid and cardiovascular system both being negative, is not in a safe position. On the other hand, if a person has had syphilis for twenty years and has the same setup the serologic positivity in the latter case certainly does not have great significance. The first case may be in the transient phase of latency, while

the second one is probably in the permanent phase of latent syphilis, so in talking about the treatment of latency, which lends itself readily to discussion because we are not familiar with the biologic background of its cause, the need for the treatment of latency is dependent on the age factor of the individual plus the duration of the syphilis. One other point worthy of emphasis is that latency in women is a different problem than it is in men, because a woman with latent syphilis may give birth to a syphilitic child although she was well treated during the early phase of the syphilis. In other words, the amount of treatment a woman receives previous to becoming pregnant has but little influence on the outcome of the pregnancy and, in order to assure her of normal offspring, treatment must be given to women with latent syphilis as early in the course of the pregnancy as possible. I think it is a great misfortune that the term Wassermann fastness has become so popular. Its popularity is due to the fact that it offers an easy way for the physician to explain an unsatisfactory situation. Wassermann fastness is not a clinical state, it is merely a group of serologic reports. I believe that the point made by the authors should be emphasized, namely, that in discussing Wassermann fastness one must first determine the clinical status of the patient, because Wassermann fastness has entirely different meanings in the different clinical stages of syphilis. In early syphilis it is a bad omen, while in late syphilis, such as hepatitis or aortitis, the persistently positive Wassermann reaction is to be anticipated, while in latency the significance of the positive Wassermann reaction can be determined only after long observation. Accordingly, when using the term Wassermann fastness it is essential that one first determine that the patient is in the phase of latency, that he does not have an aortitis or hepatitis and that the spinal fluid is negative.

DR PAUL PADGET, Baltimore. Dr. O'Leary answered the second question of Dr. Hopkins better than I possibly could have. Doubtless, that is the answer. The decision regarding treatment of the patient with latent syphilis, or regarding the interpretation of serologic resistance, depends on many factors which are highly individualized. These have not been, at our hands, subjected to mass analysis because they don't lend themselves well to statistical study. Perhaps some one will work out a method for approaching the problem, but we haven't as yet. Regarding the question of Dr. Hopkins about chronic treatment that too has not been subjected to statistical study, but on the matter I have a very strong clinical impression. Many will agree that there are certain patients who have had more or less treatment for latent syphilis who are perfectly well symptomatically and who will remain so during their lives. Others, after treatment is suspended, develop symptoms which respond to very small amounts of what can be described as chronic therapy. That is quite irrelevant to the problem of seroresistance, but it is a common clinical observation.

Anatomy of the Liver—The mass of liver substance consists of units of structure called lobules. A lobule is shaped like a polygonal prism which has five, six or seven sides and which, on cross section, has a diameter decidedly smaller than the height. Running through the center of the lobule in its long axis is the central vein, a branch of the hepatic vein, while at the periphery are branches of the portal vein and of the hepatic artery, the interlobular bile ducts, lymphatic vessels and connective tissue. The principal afferent vessel of the liver is the portal vein, which collects the blood from the digestive tract and the spleen. It enters the liver with the hepatic artery at the portal fissure. The blood from the liver is drained by the hepatic veins, which enter the inferior vena cava. The liver cells are polygonal and have six or more surfaces. They are arranged in cords which form columns extending radially from the central vein to the periphery of the lobule, the general direction being perpendicular to the central vein. Between them are broad, irregular, thin-walled blood spaces known as sinusoids which connect the ends of the interlobular branches of the portal vein and the branches of the hepatic artery with the intralobular central vein. They are lined by cells of two types—the undifferentiated lining cells and the Kupffer cells—Astrachan, Morris. Jaundice in Children, *Am. J. Dis. Child.* 53:137 (Jan. part 1) 1937.

HUMAN AUTONOMIC PHARMACOLOGY

XII THEORIES AND RESULTS OF AUTONOMIC
DRUG ADMINISTRATIONABRAHAM MYERSON, M.D.
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For the past year and a half the research division of the Boston State Hospital has been carrying on experiments on the reactions of the organs of the human being to drugs which are specifically factors in the pharmacology of the autonomic nervous system. These experiments have reached the stage where a general paper will make clear the fundamental principles and facts of human autonomic pharmacology.

The older theory of the activity of the bodily functions, so far as these are under the control of the autonomic nervous system, is that a balance exists between the activities of the sympathetic and the parasympathetic division so that visceral function is a sort of resultant of the balance of these two forces. If one translates the anatomic units of this theory into chemical terms, the activity of any organ involved by autonomic stimulation is the result of a balanced activity between acetylcholine, which is produced by the parasympathetic nervous system, and the more hypothetical series of chemical substances produced by the sympathetic nervous system at the neurovisceral junction, which are called sympathin E and I. Since the sympathins are more or less like adrenin, the chemical concept of balance may be stated as the resultant of the effects of cholinergic and adrenergic substances.

To this concept there has been added by a long and brilliant series of researches the hypothesis of the activity of the esterases (chart 1), substances produced either by the reacting cells or by the tissues in general. These substances, and especially the one described by Stedman as choline-esterase, are believed to hydrolyze or destroy acetylcholine and consequently make the action of the parasympathetic nervous system intermittent. No antagonist at present known operates in similar fashion on sympathin, and the question of whether or not there are such substances cannot be precisely studied until sympathin has been isolated. Thus, to the concept of a balance between acetylcholine and sympathin must be added the factor of the esterases—their quantity, activity and relationship to the amount of acetylcholine produced by the organism.

An examination of the results of autonomic pharmacologic experiment shows the inadequacy of even this concept of balance to explain all autonomic functions. There are organs which have only one set of innervating structures, such as the ciliary muscles. Moreover our experiments have shown that while there are some functions of organs which are apparently autonomically balanced, there are other functions in the same organs which respond to only one type of drug and consequently are either cholinergic or adrenergic. Furthermore, there are structures, such as the sweat glands which are anatomically innervated by the sympathetic system alone but nevertheless are entirely or mainly cholinergic in chemical function, that is, they respond

only to chemicals of the acetylcholine group and not at all to chemicals of the adrenergic type, although they would be expected to respond to the latter because of their anatomic structure.

In obtaining the results which are summarily recorded in this paper, four chemical substances¹ have been used (chart 2).

1 Mecholyl (acetyl-beta-methylcholine chloride) has been used as the cholinergic drug. Its action does not, however, entirely correspond to that of acetylcholine. Moreover, it is much more powerful than acetylcholine and is not so readily destroyed by the esterases. The dose varies enormously for different persons but is fairly constant at different times for the same person.

2 Benzedrine sulfate (benzyl-methyl carbamine or beta-phenyl-isopropylamine) has been used as the adrenergic drug. Here, too, the parallelism to the natural chemicals is not complete, but for practical purposes its effects correspond, except in a few instances. The drug can be administered by mouth. Its effects are prolonged, and consequently it has distinct value both experimentally and clinically.

3 Atropine sulfate (mandelic ester of tropine) has been used as the drug which inhibits the action of the

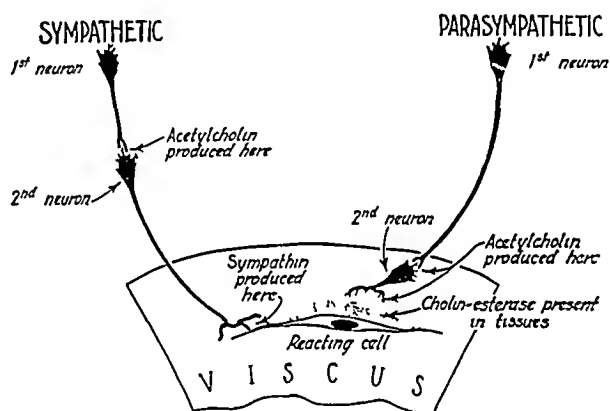


Chart 1 —Balance between sympathetic and parasympathetic nerves and esterases

parasympathetic nervous system or, more chemically, stops or prevents the action of acetylcholine or mecholyl. This action probably does not take place by paralyzing the parasympathetic system, as has been supposed, but, as Loewi has shown, takes place in or near the reacting cell. Whenever a balance obtains between cholinergic and adrenergic substances, atropine by removing the cholinergic factor acts as a synergist to the adrenergic or, in these experiments, the benzedrine result.

4 Prostigmin (dimethylcarbamate ester of m-Oxy-phenyl-trimethylammonium methylsulfate) enters into such chemical union with either acetylcholine or mecholyl so as to stabilize it, or with the esterases so as to prevent their action on mecholyl, and consequently enormously enhances the effects of this drug. It is therefore the synergist of mecholyl, as it is of acetylcholine.

Since these drugs were used in systematic relationship to one another and to the various functions of the body, the results of the experiments at the Boston State Hospital on the human being throw direct light on the autonomic pharmacology of the organs and the functions of the body.

Read before the Section on Pharmacology and Therapeutics at the Eighty-Eighth Annual Session of the American Medical Association Atlantic City, N. J., June 10, 1937.

From the Division of Psychiatric Research, Boston State Hospital, aided by grants from the Commonwealth of Massachusetts and the Rockefeller Foundation with supplementary grants from the Milton Fund, Harvard University, and the Herbert L. Celler Foundation.

¹ Merck & Co. furnished the mecholyl, Smith Kline and French Laboratories the benzedrine and Hoffmann-La Roche Inc. the prostigmin.

The following summary of the effects of these drugs on the organs of the body is based on original material presented elsewhere

1 *The Eye*—(a) The pupil constricts with cholinergic stimulation. Thus, mechohyl instilled into the conjunctival sac in proper dilution (from 2 to 10 per cent) constricts the pupil. This reaction is also brought about by the drugs which inhibit the esterases—physostigmine and prostigmin (from 2 to 10 per cent). It is abolished by the drugs which inhibit the action of the acetylcholine produced by parasympathetic stimulation and of mechohyl introduced by instillation, such as atropine, scopolamine and stramonium. The pupil dilates as a consequence of the instillation of adrenergic drugs, such as epinephrine and benzedrine (from 1 to 4 per cent). Moreover, this reaction is increased when atropine is used together with either epinephrine or benzedrine. The size of the pupil is thus a balanced function.

(b) The light reaction of the iris is definitely a balanced function. The cholinergic substances permit the reaction of the pupil to light until such a time as complete miosis is established. Prostigmin permits the reaction of the pupil to light. Atropine inhibits the reaction of the pupil to light. Benzedrine diminishes the reaction in direct relation to the concentration of the instilled solution, so that a strong solution will make the pupil rigid to flashlight stimulation, but in broad daylight the reaction of the pupil is always present after instillation of benzedrine.

(c) Intra-ocular tension is in part a balanced autonomic function. It is diminished by the instillation of mechohyl or acetylcholine and by prostigmin and physostigmine. This effect is abolished by atropine, which increases tension. Benzedrine in strong concentration (10 per cent and more) increases intra-ocular tension, while benzedrine plus atropine is decidedly synergistic in relation to intra-ocular tension.

(d) The ciliary muscle of the eye is anatomically exclusively parasympathetic. This muscle is innervated by the parasympathetic system from a nucleus in the third nerve group. The first neuron starts in this nucleus and goes to the ciliary ganglion. The second neuron starts in the ciliary ganglion and goes to the ciliary muscle. The contraction of the ciliary muscle releases the tension exerted on the lens of the eye by the ligament of Zinn, and the anterior surface of the lens consequently becomes more convex. When the ciliary muscle relaxes, the ligament squeezes the capsule into flatter shape, thus accommodating for distance. That the chemical effects are in part consistent with the parasympathetic innervation is shown by the following facts. Mecholyl increases the accommodation of the lens, especially in presbyopia. After the instillation of mechohyl, the presbyopic subject can read for a short time without glasses. This reaction is also brought about by the instillation of physostigmine or prostigmin. Prostigmin works better than mechohyl in this respect. When the two drugs are combined, the increase in accommodation is very marked. Atropine prevents and destroys this effect of mechohyl and prostigmin, and, in fact, of itself brings about a paralysis of accommodation. This action may be explained on the basis that atropine prevents the produced acetylcholine from reaching the reacting cells. Benzedrine would be expected to have no effect on the accommodation, since it is a sympathomimetic drug. This expectation is not borne out by the facts. Benzedrine tends to dis-

turb the accommodation of the lens in the same way that atropine does. When it is used in weak solution and on the young person, the proximal point for near vision is increased. In the presbyopic subject even a weak solution will produce a marked disturbance of accommodation, while clearness of vision is definitely obscured in all subjects. This effect probably occurs through direct relaxing action on the ciliary muscle or possibly on the lens.

2 *Sweat*—The production of sweat is a cholinergic function although sympathetic in innervation. Mecholyl and pilocarpine cause marked alkaline general sweating. Localized sweating can be brought about by intradermal injection. This effect is greatly enhanced by prostigmin, although in itself this drug produces no sweating. Atropine abolishes or prevents these effects. Epinephrine and benzedrine have no effect in ordinary doses on the sweating.

3 *The Circulation*—(a) The heart. The conductivity of the bundle of His is decreased by cholinergic stimulation. This is quite definitely shown in our experiments by the electrocardiogram. The lengthening of the interval between P and R components is enhanced

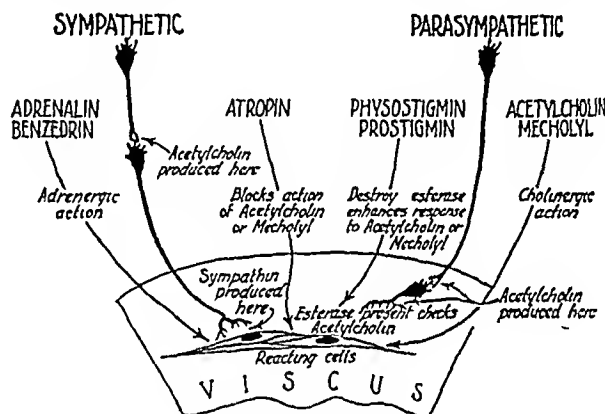


Chart 2—Working hypothesis of human autonomic pharmacology

by the substances which destroy the esterases, such as prostigmin. Combining mechohyl and prostigmin lengthens the distance between P and R to the point of heart block. Further confirmation of this balance is seen when atropine is administered after mechohyl or mechohyl and prostigmin. Shortly after this drug is introduced the normal PR interval is reestablished and heart block of this pharmacologically induced type disappears.

(b) The blood pressure. This is a balance. Mecholyl, injected intramuscularly or otherwise, lowers the blood pressure and brings about vasodilatation. The use of prostigmin enormously enhances this effect, although in itself prostigmin does not affect the blood pressure. Atropine abolishes this effect of mechohyl or acetylcholine, and the blood pressure rises to normal or even higher. Benzedrine (or epinephrine) markedly increases blood pressure, and this effect is enhanced if atropine is used to paralyze or to inhibit the effect of the body's acetylcholine.

(c) The pulse rate. Mecholyl acts rather paradoxically on the pulse rate. Its first effect in moderate dose (from 15 to 30 mg) is to increase the pulse rate by direct effect on the pacemaker. If large doses are given, the effect of lessened conductivity becomes pre-

dominant and slow pulse finally results. If prostigmin is given in sufficient dose together with or preceding mechoyl, the pulse is markedly slowed. Atropine abolishes the effect of mechoyl if given in sufficient dose intravenously. Benzedrine is also paradoxical in its effect on the pulse rate. It tends to slow the heart rate although not markedly. If it is given with atropine, the pulse rate is greatly increased.

Thus, so far as the heart rate is concerned, mechoyl should be supplemented by prostigmin in order to get full parasympathetic effect, while to benzedrine, atropine must be added for typical sympathetic results.

4 *The Gastro-Intestinal Tract*—(a) Gastric and intestinal tonus is a balance between acetylcholine, sympathin and the esterases. The gastro-intestinal tonus is greatly enhanced by mechoyl, especially if the bowel and stomach are atonic. This effect is markedly increased by previously or simultaneously administered doses of prostigmin. If sufficient prostigmin is used, a very small dose of mechoyl will produce profound results. This effect is abolished by atropine. The gastro-intestinal tonus is diminished by benzedrine, epinephrine and ephedrine—adrenergic drugs. Thus, benzedrine relaxes spasm of functional or organic type rapidly. This effect, however, does not appear to be enhanced by atropine, or at any rate the results are not predictable.

(b) The secretion of the juices of the stomach may be a balance, but this is not clearly demonstrable. Mecholyl abolishes acidity and renders juice alkaline, but since this is accompanied by an alkaline mucus it may not be a "balanced" result. It also increases the amount of the juices, and pepsinogen disappears. Prostigmin enormously enhances these effects, showing that esterase is a factor. Atropine abolishes or prevents these results of cholinergic stimulation, while benzedrine increases acidity and pepsinogen content but diminishes the amount of gastric juice. Atropine is synergistic to benzedrine in producing these effects.

(c) The relaxation of the gallbladder is brought about by both sets of drugs. Mecholyl and mechoyl plus prostigmin delay the emptying of the fatty meal. Atropine, however, causes similar, but more marked effects. Benzedrine causes a delayed atonic reaction, so that after two hours the gallbladder does not empty after a fatty meal.

5 The tonus of the genito-urinary bladder is a balance. Mecholyl has some slight constricting effects on the full bladder. The esterases seem to have a very important rôle, because prostigmin added to mechoyl greatly enhances the bladder tonus, constricting the bladder to one third of its normal size and capacity, although by itself prostigmin has little effect. Atropine relaxes the bladder after the effects of prostigmin and mechoyl have been obtained. Benzedrine relaxes bladder tonus very moderately, and atropine is synergistic in this respect.

COMMENT

In using these drugs, namely, mechoyl, benzedrine, prostigmin and atropine, certain definite and general principles must be kept in mind. Any increase in the amount of prostigmin used renders mechoyl enormously effective and to the point of danger to the patient. A dose above 1 mg of prostigmin makes it undesirable to use mechoyl in any amount above 5 or 10 mg. A safer dose of prostigmin is 0.5 mg. (These figures apply only to intramuscular injection, the use

of prostigmin by mouth has a wider range of safety.) Moreover, atropine should always be held in readiness whenever mechoyl is to be used alone therapeutically or experimentally. Practically speaking, there is no danger, no matter what the effect of mechoyl may be, if atropine is used intravenously or intramuscularly in sufficient dose. The administration of one-fiftieth grain (0.0013 Gm.) intravenously blocks, practically speaking, all effect of mechoyl.

If, however, prostigmin is used in addition to mechoyl, atropine is not sufficient to check the effects. Evidently the choline-esterase and atropine are synergistic so far as blocking the effects of mechoyl is concerned. Consequently, whenever the esterases have been removed as a buffer to mechoyl by the use of prostigmin, it is advisable to add epinephrine, benzedrine or, better still, the combination of the two, to the atropine. With such treatment the ill effects of excessive doses rapidly disappear.

It is probable that the electric current will furnish an important and useful way of introducing mechoyl for therapeutic purposes. In cases of gastro-intestinal disease and in the experiments carried out on blood pressure, it has been possible to maintain a mild general effect for hours, so that, for example, the juices of the stomach became definitely alkaline and mucous without any profound disturbances of blood pressure and heart rate and without the creation of marked general sweating.

It is to be kept in mind that benzedrine and atropine are synergists and that when the combination is used the dose of each drug must be reduced in order to get any beneficial effects without too many untoward results. The mood effects of benzedrine are best produced by small doses, and in many cases 2.5 mg. two or three times in the morning will produce far better results than large doses. In fact, it may be stated that the mood effects occur beneath the threshold at which the visceral changes take place.

These experiments also indicate that it is possible by pharmacologic experiment to reproduce many of the so-called symptom complexes. Thus, achylia gastrica is simulated by the action of mechoyl. Heart block can be readily produced by prostigmin and mechoyl. The spastic condition of the colon, as well as the atonic one, can be reproduced by the use of mechoyl and benzedrine, respectively. If sufficient prostigmin is used, the presbyopic eye can be transformed for a time into the myopic eye. In other words, the gradually developing theory that repeated functional disturbances may eventuate into organic disease has at least a working basis in the effects of these drugs.

Perhaps the most novel general implication is the emphasis to be laid on the esterases. These products of bodily activity have an important role in the regulation of cholinergic or parasympathetic activity. There may be, and it seems likely that there are, conditions of hyperesterasia, that is to say, situations in which the esterases are present in too great a quantity to permit the free working of the acetylcholine produced by the body. This might well be the case in presbyopia. On the other hand, there are conditions in which hypoeesterasia may be postulated, as when there is hyperactivity of cholinergic type or of parasympathetic origin. Heart block might thus be interpreted. It will be necessary to isolate the esterases before this hypothesis can be tested against fact.

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THE REFLEXES IN THE PROGNOSIS OF TRANSVERSE LESIONS OF THE SPINAL CORD

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The question of the reflex functions of the spinal cord in man, as one so often discovers in reviewing neurophysiologic matters, is one in which even incomplete elucidation has been surprisingly recent. Until the last decade of the last century, despite the comparative frequency with which injuries and other lesions produce physiologically and even anatomically complete division of the spinal cord, the clinical manifestations, as reflected by the reflexes, had not been accurately recorded. It was generally understood that the great motor pathways exert an inhibitory influence on the deep reflex arcs of the lower extremities and that transverse destruction of the spinal cord should therefore result in exaggeration of such reflexes.

In 1890 Bastian¹ made the first important contribution in regard to correcting this conception. He stated that a complete lesion in the lower cervical or upper dorsal levels resulted in flaccidity of the limbs and absence of the tendon reflexes. He was shortly supported by other clinicians, notably Bruns² in Germany, and we now know as Bastian's or as Bastian-Bruns' law that "if there is a complete transverse lesion in the spinal cord cephalad to the lumbar enlargement, the tendon reflexes of the lower extremities are abolished."

In 1902 Warrington³ modified this law in the respect that "when the disease is of a slowly progressive nature the reflex functions of the cord may be retained." That is, he limited the application of the law to immediate or rapidly developing conditions. Experimentally this contention is confirmed, and the loss of tendon reflexes which obtains in cases of acute transverse lesions of the spinal cord is now accepted as being a part of the complex known as "spinal shock," investigation of which was largely instigated by Sir Charles Sherrington⁴.

The greatest clinical contributions toward completing the chronicle of what happens to the reflexes after rapid or immediate physiologic section of the spinal cord were the result of the opportunities for observation of such injuries afforded by the Great War. In a paper by Riddoch,⁵ written in 1917, material from many sources was digested and added to his own, and the conclusion was reached that after an initial period of "spinal shock" and absent reflexes there is a recovery of reflex activity of a modified and diffuse sort. This exists until the death of the patient, except for the intervention of such toxic febrile states as are induced by urinary sepsis or infected decubitus ulcers, which have the effect of depressing reflex functions to the point of inanition.

In summary, it is now recognized that a reasonably rapidly produced total transverse lesion of the spinal cord in man will result clinically in (1) a stage of muscular flaccidity and completely lost tendon and plantar reflexes, usually lasting from one to several weeks, (2) a stage of reflex activity, of variable duration depending on the occurrence of any toxic febrile state, and (3) a final stage of inanition. There are rare exceptions in which the first stage is permanent particularly when the level of the lesion is caudal enough to approach the lumbar enlargement. There are also cases in which there is some response from the outset to plantar stimulation, either flexor (Holmes⁶) or extensor (Collier⁷). In the main, however, these rules are axiomatic.

As a corollary to Bastian's law, clinicians have come to recognize that absence for any length of time of the tendon and plantar reflexes of the lower extremities associated with conditions causing transverse lesions of the spinal cord is a grave prognostic sign. This is true not only of mechanical trauma but also of such lesions as malignant metastases to the spine and epidural abscesses and indeed of anything which physiologically blocks the transmission of ascending and descending impulses. It is not uncommon in cases of concussing and nonpermanent injuries of the spinal cord to find a transitory flaccidity and depression of the tendon reflexes, but when these conditions persist more than a few hours, or a day or so at most, practical experience has taught that a geometrically progressing pessimism as to any return of useful function is the safest attitude.

This also applies to surgical lesions which press on the spinal cord. Many physicians have seen benign neoplasms slowly produce complete spastic paraplegia with retained reflexes, existing many months, and a spectacular return of function after removal of the cause despite the grossest deformity of the cord itself. On the other hand, when one sees paraplegia going on to completion within a week or ten days and finds flaccid lower extremities, with the tendon reflexes absent, instinct warns that the lesion is probably malignant and possibly metastatic. Experience dictates that even though operation satisfactorily removes the mass and restores and maintains the normal dynamics of the cerebrospinal fluid, the prognostication for the distal segment of the cord must be unfavorable. Removal of the identical type of lesion shortly before the reflexes are lost may permit recovery, sometimes lasting years with the aid of roentgen therapy. The same is true of epidural abscesses. I have operated on four patients. In two "spinal shock" was not complete in that the reflexes were retained. Those patients recovered useful function. In the other two the abscesses had had time to produce flaccid paraplegia with absence of the reflexes. Those patients recovered from the infection but never from the paraplegia and instead went on through the same stages as those observed in patients with actual mechanical transection of the spinal cord.

One qualification should be elaborated here with respect to malignant processes and epidural abscesses, that is, that they have the faculty of inducing "spinal shock" more quickly than their mere mechanical pressure would justify. It is not at all infrequent for benign lesions, such as meningiomas and neurofibromas,

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Read before the Section on Nervous and Mental Diseases at the Eighty-Eighth Annual Session of the American Medical Association Atlantic City, N. J., June 10, 1917.

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2. Bruns Ludwig. Ueber einen Fall totaler traumatischer Zerstörung des Rückenmarkes an der Grenze zwischen Hals- und Dorsalmark. *Arch. f. Psychiat.* 25: 759-830, 1893.

3. Warrington W. B. Some Recent Work on the Condition of the Deep Reflexes and Other Symptoms in Transverse Lesions of the Cord. *A Critical Review. M. Chron.* 4: 101-119, 1902-1903.

4. Sherrington C. S. The Integrative Action of the Nervous System. New York: Charles Scribner's Sons, 1915.

5. Riddoch George. The Reflex Functions of the Completely Divided Spinal Cord in Man Compared with Those Associated With Less Severe Lesions. *Brain* 40: 264-402 (Nov.) 1917.

6. Holmes Gordon. Spinal Injuries of Warfare. *Gouldsonian Lectures Brit. M. J.* 2: 769-774 (Nov. 27) 1915.

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to bring on paraplegia rapidly after a more or less prolonged prodromal period of vague, indefinite symptoms. This usually occurs when the neoplasm finally attains sufficient size to become completely jammed in the dural sheath and so produces edema and anoxemia in the contiguous cord, and it may also happen because of shift in position with the same end result, as witness the occasional marked exacerbation in symptoms following lumbar puncture. In such instances the reflexes are lost with exceptional rarity and the condition may exist a long time without causing irreparable damage. Abscesses and malignant processes, however, apparently possess the additional property of being toxic to neighboring structures, and this, in the spinal cord, hastens its destruction.

The point therefore of this discussion is that the astute observer has come to rely greatly on the tonicity of the muscles and the state of the tendon reflexes of the lower extremities during the initial stages of any paraplegia in determining what his predictions for the future are to be. Granted that mechanical trauma to the cord may merely concuss it and produce transitory flaccidity and loss of reflex activity,⁸ a continuance of this condition for any length of time almost invariably indicates permanent and complete disability. In the case of paraplegia caused by neoplasms and infections, the same prognosis applies to an even shorter-lived appearance of the manifestations of "spinal shock."

In view of the foregoing criteria it may be well to mitigate the usual hopelessness of continued flaccid paraplegia with absent reflexes by citing a case.

V H, a man, aged 25, an office clerk, admitted March 11, 1934, on the recommendation of Dr George B Hassin first noticed a heavy feeling in his legs eight years previously while in high school. His legs tired easily on standing or exercise, and when he endeavored to play tennis or any similar sport he would be forced to quit in a few minutes because his legs gave out. This condition became progressively worse and became associated with so much spasticity that the patient finally experienced the greatest difficulty in locomotion. There were no associated sensory change and no difficulty with the sphincters, and the disability was confined to the lower extremities. The deep reflexes in the legs were markedly exaggerated, and there were pronounced pathologic reflexes bilaterally. There were no sensory changes of any type, nor were there any abnormal neurologic conditions elsewhere in the body, even the epigastric abdominal and cremasteric reflexes being present. A lumbar puncture was performed, and it revealed clear and colorless fluid with an initial pressure of 100 mm of spinal fluid. There was no block on jugular compression, and the cell count and total protein content were normal. The Wassermann reaction was 2 plus in a 0.5 dilution, and the colloidal gold reaction showed a curve of 1112221100. The Wassermann reaction of the blood was negative.

This patient had been in several institutions previously, where therapy of all kinds had been administered to him without any apparent effect on the slow progress of his condition and, since he was on the verge of being completely incapacitated, he was desperately anxious for operation to be performed. Since Hassin⁹ had reported several similar cases in which there were arachnoid changes in the thoracic section of the cord even in the absence of dynamic changes in the fluid and had had good results in two reported cases from operations for this condition

operation was urged and finally agreed on by all concerned. I accordingly went ahead on March 12, and the following is an extract from my operative note of that date: "Laminectomy was unusually simple and bloodless. The seventh, eighth and ninth dorsal vertebrae were delaminated. Normal looking cord was exposed surrounded by somewhat thickened arachnoid which was rather adherent to the cord. The arachnoid was opened throughout the operative wound and a soft rubber catheter passed 15 cm caudally and cephalad without difficulty."

The operative note of March 13 tells of the events in the hours following operation. This boy has had a disconcerting thirty-six hours. After yesterday morning's procedure he was perfectly able to move his legs as before and had normal sensation. This persisted all day and evening, and the patient voided normally during the evening. This morning on awakening he noticed a prickly feeling up to the umbilicus. His legs could still be moved but not as well as formerly. This paresthesia increased during the day, and the legs became progressively weaker, so that by midafternoon there was complete paraplegia with a sensory level at the umbilicus below which sensation was nearly gone. The deep reflexes of the legs were still present. I saw the patient at this time and immediately reopened the operative wound. A moderate amount of blood had clotted in the canal, and I removed it as best I could. A gutta-percha drain was placed in the canal and the wound closed. After this procedure, while he was still in the operating room, the patient could move the toes of his left foot.

After a few hours' relief, however, the transverse lesion progressed, and my note of March 14, the day following the secondary procedure, states that there was complete flaccid paraplegia with a complete sensory level, a complete abolition of all deep reflexes and a complete loss of control of the sphincters. There was no response to attempts to elicit a Babinski reflex. On March 15, the second postoperative day, I was able to obtain a slight knee and ankle jerk on the right side, and the patient thought he had slight sensation in the left leg. On March 16, the third postoperative day, however, no deep reflexes and no plantar response could be obtained in either leg, and this condition still persisted on March 18, the fifth postoperative day. On this day there were also some fibrillary twitchings of the small muscles of the left foot.

In desperation, in view of the fact that the reflexes had been entirely absent for five days except in one leg for a transitory period the operative wound was reopened, the note of that date states as follows: "This boy still has signs of a complete transverse softening. I thought it best once more to look in and accordingly reopened the wound. There was little blood in the wound, and the dura was quickly uncovered and found to be pulsating freely and normally. The wound was reclosed with drainage, and testing immediately after the operation revealed complete absence of all reflexes and of all sensation."

The patient remained in the hospital for some time and a discharge note of April 3, twenty-three days after the original operation, states that there was still a sensory level at the ninth dorsal segment but that there was a just beginning slight indication of recovery of function, shown by a vague sensation to pin prick in the left extremity and a barely perceptible knee and ankle jerk in the right extremity. Complete flaccidity was still present, all reflexes were still absent in the left leg, there was no voluntary motion on either side and there was no control of the sphincters.

From that time until now, an interval of approximately three years, the patient has improved. He is able to rise from his chair with the aid of two canes, to walk about the house by himself, to mount the stairs to his bedroom and lavatory on the floor above and to descend the front steps to enter his automobile. He is continent of urine and feces, voiding at intervals of about four hours. His legs are spastic, and his knee and ankle jerks are bilaterally exaggerated and associated with clonus. The Babinski reflex is bilaterally present. There is no definite sensory level but the right leg is more useful than the left and is slightly more hypesthetic. The patient is sexually potent.

COMMENT

It is obvious that a desperate attempt was being made in this case to salvage what seemed an irre-

8. Hugh Cairns and George Riddoch (Observations on the Treatment of Ependymal Gliomas of the Spinal Cord *Brain* 54: 117-146 [June] 1931) described instances of this in the postoperative course of two patients operated on for ependymal gliomas of the cord with subsequent satisfactory return of useful function. In one case however one knee jerk was never lost and voluntary power for but a few hours in the other an early disappearance of flaccidity may be assumed because muscular spasms began during the second twelve hours after ether anesthesia. Voluntary motion of one leg in the second case occurred on the third day the day the tendon reflexes began reappearing.

9. Hassin G B and Andrews Edmund. Serous Spinal Meningitis (Circumscribed). *J A M A* 92: 877-880 (March 16) 1929.

trievable accidental complication That the effort succeeded in a measure is beside the point The value of the report lies in the demonstration that even in the face of what seem inexorable precepts there are exceptions to the rule

SUMMARY AND CONCLUSIONS

1 Paraplegia from any source, whether traumatic, neoplastic or infectious, when associated with complete flaccidity and total absence of tendon reflexes existing more than a day or two in the first instance and more than a few hours in the other two, is an almost hopeless prognostic sign despite removal of the cause

2 In the treatment of acute conditions causing paraplegia, such as epidural abscess and malignancy, immediate operation is therefore advised

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ABSTRACT OF DISCUSSION

DR JAMES L POPPEN, Boston Dr Oldberg has emphasized that prognosis varies greatly as to the return of useful function following removal of the cause in conditions producing transverse lesions of the spinal cord A guarded prognosis must be given in most cases of transverse lesions, especially those caused by neoplasm This holds true for either the extramedullary or the intramedullary type, provided enucleation can be accomplished without added damage to the cord directly or its blood supply Our results are much the same as those of Dr Oldberg An acute and a subacute epidural abscess has caused unfavorable results in cases in which there was associated myelitis or thrombosis of the intrathecal vessels, but the results have been satisfactory in patients with uncomplicated epidural abscess in whom adequate drainage was instituted The ultimate prognosis in cases of malignant metastatic lesion of the spinal cord is unfavorable Nevertheless useful function in many instances may be restored for a time with high voltage roentgen therapy given over carefully mapped out segments of the spinal cord This is especially true of the Hodgkin's group and holds true in some cases of carcinoma An extramedullary tumor with a transverse lesion of the spinal cord offers an excellent chance for complete recovery, although caution must be used in making a prognosis in these cases, since persons with long-standing paralysis may regain useful function in a relatively short time after relief of the compression, whereas patients with a short history of paralysis may never regain useful function or regain it only after a long course of extensive physical therapy That useful recovery does occur after complete extirpation of an intramedullary tumor which involved the entire length of the spinal cord is demonstrated by the following brief case report H N, a woman, aged 29, had pain between her shoulder blades in 1928, accompanied by slight weakness of the lower extremities The condition progressed so that by 1929 she had total paralysis of the lower and partial paralysis of the upper extremities There was complete incontinence of the bladder and bowels An exploratory laminectomy Sept 29, 1930, with removal of the first, second and third dorsal laminae, revealed a swollen cord Radical surgical intervention was not attempted at this time Progressive improvement was noted after the laminectomy, so that in 1933 the patient was able to resume work requiring her to stand eight hours a day and could attend dances In 1935 weakness of the lower extremities again developed, so that by April 1936 she was completely paralyzed, with return of incontinence of the bladder and bowels In December 1936, when she was first seen at the clinic, a laminectomy was performed extending from the foramen magnum to the third lumbar vertebra Complete extirpation of a huge intramedullary tumor which involved the entire length of the cord was successfully performed Slow but progressive recovery of function of the lower as well as the upper extremities took place, so that the patient was able to take a few steps with assistance, June 2, 1937 She had complete flaccid paralysis for two weeks following operation Dr Shields Warren reported the tumor to be a neuroblastoma glomatosum

DIFFERENTIAL DIAGNOSIS OF PAIN LOW IN THE BACK

ALLOCATION OF THE SOURCE OF PAIN BY THE
PROCAINE HYDROCHLORIDE METHOD

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IN COLLABORATION WITH J V LUCK, MD

IOWA CITY

Owing to the scarcity of pathologic evidence, there exists much perplexity as to the origin of the pain accompanying disorders in the lower part of the back, and one wonders whether the old conceptions of the sacrolumbar and sacro-iliac entities are any longer adequate

In the last two decades certain morphologic factors, principally of the type of anatomic variations, have been variously claimed as producers of pain low in the back, but in most instances no convincing causal connection could be established For instance, in the question of the long-impinging transverse process and of sacralization, physicians are today far from acknowledging the so-called Bertolotti syndrome (sacralization, sciatica and scoliosis) Although it is a variation of high frequency (176 per cent), many doubt its pathogenic significance (Putti,¹ Hass²) Zur Verth³ considered resection not justified

The case of the horizontal sacrum and other architectural deficiencies making for instability of the lumbosacral joint has a better foundation When it can be shown where pressure on the lumbosacral articular facets exists, a causal relation must be accepted (Mouchet and Roederer⁴) Also there is no doubt that posterior displacement of the fifth lumbar vertebra is found associated with severe pain in the back (A D Smith⁵) and that in the great percentage of patients showing architectural deficiency of the fifth lumbar vertebra some indirect causal connection exists Dickson⁶ mentioned such architectural weakness (increased angle, defective sacrolumbar articulation, sacralization, spinal cleft) in 35 per cent of all spines, 50 per cent of these are symptomless

Separate neural arch (Chandler,⁷ frequency 5 per cent, Wilks⁸) is another deformity considered congenital (although the congenital nature is contested by Klose-Gerlich,⁹ who found no such deformity in new born infants), for which direct connection with pain is undecided So are prespondylolisthesis and spondylolysis, which are associated with pain in the back (Kleinberg¹⁰) United apophyses of the articular process are often regarded as the cause of pain, but

Read before the Section on Orthopedic Surgery at the Eighty Eighth Annual Session of the American Medical Association Atlantic City N J June 10 1937

An article by K O Haldeman on the injection of procaine hydrochloride in the diagnosis and treatment of derangements of certain joints (California & West. Med 44 286 [April] 1936) deals in a more general way with a similar principle

1 Putti V Lomborartite e sciatica vertebrale Bologna L Cappelli 1936

2 Hass Julius Welche Ursachen liegen den Rücken und Kreuzschmerzen zugrunde? Wien klin Wchnschr 42 1572 (Dec 5) 1929

3 Zur Verth M Monatschr f Unfallh vol 5

4 Mouchet A and Roederer C Le spondylolisthesis Rev d'orthop 14 6 (Dec) 1927

5 Smith A D Posterior Displacement of the Fifth Lumbar Vertebra J Bone & Joint Surg 16 877 (Oct) 1934

6 Dickson F D South M J 29 365 (April) 1936

7 Chandler F A Lesions of the Isthmus of the Laminae of the Lower Lumbar Vertebrae and Their Relation to Spondylolisthesis Surg-Gynec & Obst 53 273 (Sept) 1931

8 Wilks T A Backward Displacement of Fifth Lumbar An Optical Illusion J Bone & Joint Surg 17 347 (April) 1935 Backache from Vertebral Anomalies Surg Gynec & Obst 28 658 (May) 1924

Separate Neural Arch J Bone & Joint Surg 13 709 (Oct) 1931

9 Klose Gerlich Joachim Ztschr f orthop Chir 63 31 1935

10 Kleinberg Samuel Prespondylolisthesis Backache with Sacral Radiation J Bone & Joint Surg 15 872 (Oct) 1933

they are also found incidentally in x-ray examinations without causing pain (Nichols and Shiflett¹¹) Putti¹ rejected both sacralization and tropism as adequate causes of pain

In the final analysis, all congenital anomalies are now considered mainly as predispositional (Steindler,¹² Ayers¹³), though true impingements no doubt occur as the immediate pain-producing factors (Zur Verth³)

In the report to the Clinical Orthopaedic Society in 1928 (Billington, Willis and O'Reilly¹⁴), based on seventy-nine answers to questionnaires, the general discrepancy as to what is considered pain producing is especially noticeable Arthritis was given in thirty responses, posture in eighteen and trauma with muscle strain in fifteen as the immediate causes and predisposition (by abnormalities) in fifty-three as the remote cause

There is little in the literature to answer the question of specific allocations of pain Where and in what tissue does it actually originate?

POSTERIOR DIVISION OF SPINAL NERVES

We propose to approach the problem of allocation of pain first by abandoning the old classification of sacro-iliac and sacrolumbar groups and, secondly, by following the routes of sensory supply to the tissues of the lumbosacral region To this end it is first of all necessary to differentiate between the territory of the posterior and that of the anterior primary divisions of the spinal nerves and to define anatomically the ramifications of the posterior division as well as the structures which they supply

The posterior division of the lumbosacral portion of the spinal nerve (fig 1) supplies the long muscles of the back (sacrospinalis), all the posterior ligamentous structures, the aponeuroses and periosteal attachments, a portion of the gluteal fascia, the lumbodorsal sheath, the supraspinous and interspinous ligaments, the superficial and the deeper iliosacral ligaments, the sacro-ischial ligaments, and in part the iliolumbar ligament, the intervertebral articulations and the sacro-iliac articulations (Pitkin¹⁵)

Irritations are apt to produce either sharply localized superficial pressure points at ligamentous and aponeurotic attachments or more diffuse areas of tenderness in muscles and sheaths

These localized peripheral lesions are capable of producing radiation not only in the posterior but in the anterior division along many different pathways Furthermore, they produce postural anomalies the same as those produced by irritation of the nerves of the anterior division

The frequency of radiation of pain low in the back is variously given at from 36 per cent (Steindler¹⁰) to 60 per cent (Miltner¹⁷), but, as Kuhns¹⁸ very appropriately put it, "We cannot use with assurance the radiation of pain to various areas of the lower extremity in the differential diagnosis of low back injuries"

- 11 Nichols B H and Shiflett E L J Bone & Joint Surg 15 591 (July) 1933
- 12 Steindler Arthur Diseases and Deformities of the Spine and Thorax St Louis C V Mosby Company 1929
- 13 Ayers C E New England J Med 213 716 (Oct 10) 1935
- 200 592 (March 21) 1929
- 14 Billington R W Willis T A and O'Reilly Archer Report for the Clinical Orthopaedic Society J Bone & Joint Surg 10 290 (April) 1928
- 15 Pitkin H C and Pheasant H C Sacroarthrogenetic Tetralgia I J Bone & Joint Surg 18 111 (Jan) 1936
- 16 Steindler Arthur Low Back Pain An Anatomic and Clinical Study J Iowa M Soc 15 473 (Sept) 1925
- 17 Miltner I J Low Back Pain Study of 525 Cases of Sacro-iliac and Sacrolumbar Sprains J Iowa M Soc 20 473 (Oct) 1930
- Miltner L J and Lowendorf C S J Bone & Joint Surg 13 16 (Jan) 1931
- 18 Kuhns J G Low Back Pain Rhode Island M J 19 9 (Sept.) 1936

ANTERIOR DIVISION

The pathways of the anterior division may be discussed briefly, as they do not involve the immediate problem Probably the best established localization is that of intraspinal pathologic change in the vertebral canal, the diagnosis of which rests on the combined radiation through the posterior and anterior divisions, the sensory disturbances, paresthesia and anesthesia, motor weaknesses and the reaction of spinal fluid and block symptoms (Mixer,¹⁹ Tamaki²⁰), and radiation to the genitalia in tumor of the cauda equina (Mixer and Barr,^{20a} Podhala²¹)

The early knifelike pains in extramedullary tumor, numbness, paresthesias, motor weakness and involvement of the sphincter, as well as the changes in the cerebrospinal fluid, often make early allocation possible even without the use of iodized poppy-seed oil (Kulenkampf²²) Pain on coughing or straining and Browne-Sequard's symptoms are very suggestive (Grant²³), often making myelography dispensable (Lindstrom²⁴) This applies also to compression of the roots caused by scars or thickened ligamenta flava (Towne and Reichert²⁵)

Somewhat more difficult is local diagnosis when the damage occurs in the intervertebral foramen In con-

TABLE 1—Clinical Analysis of Cases of Pain Low in the Back for 1936

Diagnosis	Number of Cases	Radiations of Pain				Secondary Scoliosis
		Sacrum and Gluteus	Gluteus and Posterior Part of Thigh	Gluteus Thigh and Leg		
Arthritis (atrophic and hypertrophic)	142	11	34	40	39	
Posterior ligamentous syndrome	114	10	39	41	43	
Myofascial syndrome	101	9	30	46	33	
Anomalies of the fifth lumbar vertebra	57	4	16	23	18	

trast to the earlier conception of the funicular type of root pain, the tendency is rather to allocate the pain in and about the intervertebral foramen (Putti¹)

A number of salient points have been brought out in connection with this problem The narrowing of the lumbosacral foramen was described first by Danforth and Wilson,²⁶ who found that the lumbar foramina became increasingly smaller while the nerve roots increased in diameter, the fifth lumbar vertebra being the thickest Furthermore, there is a natural narrowing by collapse in cases of thinning of the fifth lumbar intervertebral disk (Williams and Yglesias²⁷), especially in spondylosis (Lob,²⁸ Bailey and Casamajor,²⁹ Janek³⁰) and in Bechterew's disease (Hohne³¹)

- 19 Mixer W J and Ayer J B Herniation or Rupture of Intervertebral Disk into Spinal Canal New England J Med 213 385 (Aug 29) 1935
- 20 Tamaki K Thirty Nine Extramedullary Tumors of the Spinal Cord Am J Surg 22 397 (Dec) 1933
- 20a Mixer W J and Barr J S New England J Med 211 210 (Aug 2) 1934
- 21 Podhala Slovansky Sbornik Ortopedicky 10 4 1935
- 22 Kulenkampf D Beitr z Klin Chir 159 559 (June) 1934
- 23 Grant F C Spinal Cord Tumors Am J Surg 33 89 (Jan) 1934
- 24 Lindstrom Nik Acta orthop Scandinav 7 86 1936
- 25 Towne E B and Reichert F L Ann Surg 64 327 (Sept) 1931
- 26 Danforth M S and Wilson P D J Bone & Joint Surg 7 109 (Jan) 1925
- 27 Williams P C and Yglesias Luis J Bone & Joint Surg 15 579 (July) 1933
- 28 Lob Alfons Deutsche Ztschr f Chir 240 441 1933
- 29 Bailey P and Casamajor L J Nerv & Ment Dis 38 588 1911
- 30 Janek J Slovansky Sbornik Ortopedicky 10 5 1935
- 31 Hohne Christian Arch f orthop u Unfall Chir 35 3 1935

The greatest importance, however, is attributed to the pathologic changes in the intervertebral articulations themselves as the causes and the seat of pain low in the back (Lange³²), especially in arthritis deformans (Leubner³³), so frequently seen after the age of 60 (Guntz,³⁴ Hawley³⁵) Ghormley³⁶ spoke of

TABLE 2—Patients with Pain Low in the Back Who Received Injections of Procaine Hydrochloride

Location of Injection (Site of Tenderness)	Number of Cases	Radiations of Pain				Results of Injection		
		Sacrum and Gluteus	Gluteus and Posterior Part of Thigh	Gluteus Thigh and Leg	Secondary Scoliosis	Complete Temporary Relief	Partial Temporary Relief	No Relief
1 Posterior superior iliac spine								
Lateral	63	4	20	20	43	47 (74%)	7 (11%)	9 (14%)
Medial	23	2	6	13	15	17 (60%)	6 (21%)	6 (10%)
2 Lumbosacral joint	13		4	7		8 (61%)	3 (23%)	2 (16%)
3 Transversosacral articulation or impingement	9	1	3	5	4	7 (78%)	1 (11%)	1 (11%)
4 Supraspinous and interspinous ligaments	14	2	8	2	2	13 (93%)	1 (7%)	
5 Lumbodorsal fascia	9	3	2	1	2	8 (90%)	1 (10%)	
6 Combination of 1 and 2	7	1	1	3		3 (43%)	1 (14%)	3 (43%)

a regular "facet syndrome," which is expressed not only in sciatic pain but in lumbosacral pain without sciatica. Indeed, this possibility is obvious, though some authorities still deny compression of the nerve root at the point of egress (Ely³⁷).

While the origin of root pain within the intervertebral foramen is being more and more accepted in contrast to the funicular origin, we like to point out one anatomic detail which heretofore has found little attention.

Purkinje in 1845 and Luschka³⁸ in 1850 described what they called the nervus sinuvertebralis, a fine structure receiving a white ramus from the common trunk and a gray ramus from the sympathetic chain just outside the intervertebral foramen. This nerve turns back into the intervertebral canal, and, after having supplied with a costal branch the ligamentum colli costae and the neck and head of the rib, it spreads around the longitudinal vertebral sinus, communicating with the intervertebral veins, the posterior and external venous plexuses and the basivertebral veins (Poirier,³⁹ Cunningham⁴⁰), the nerve endings go to the pedicles, the interior of the bodies, the loose areolar perimeningeal tissue and the periosteum. As Luschka remarked, they transmit the feelings of spinal irritation, paresthesia, chilling and sensations of heat so often observed with the arthritic spine and yet so seldom seen in cases of sciatic radiation of pain low in the back (fig 2).

- 32 Lange Max Munchen med Wchnschr 80 1134 (July 21) 1933
 33 Leubner Hugo Ztschr f orthop Chir 65 42 1936
 34 Guntz Eduard Arch f orthop u Unfall Chir 34 353 1934
 35 Hawley S J Pennsylvania M J 35 168 (Dec) 1934
 36 Ghormley R K Low Back Pain J A M A 101 1773 (Dec 2) 1935
 37 Ely L W Proc Staff Meet Mayo Clin 6 112 (Feb 25) 1931
 38 Luschka H Die Nerven des menschlichen Wirbelkanals Tubingen H Laupp 1850
 39 Poirier Paul Traite d'anatomie humaine Paris Masson & Cie 1896
 40 Cunningham D J Text Book of Anatomy ed 6 New York William Wood & Co 1931

This point may serve as an argument (as referred to later) that probably more cases are of purely reflex origin and not due to direct compression in the intervertebral canal than is generally accepted.

That sacralization is the sole cause of radiating pain as assumed by Bertolotti and Rossi, is at least doubtful. However, the formation of a true joint between the fifth lumbar transverse process and the sacrum opens the possibility of transversosacral arthritis (Ingebrigtsen⁴¹). In several cases of our series such an arthritis could be shown in the roentgenogram, and in three cases removal of the process cured the sciatica.

POSTERIOR SYNDROME

At the outset of our studies we relinquished the classification into the vertical units of the sacrolumbar and the sacro-iliac region for the horizontal units of systems, particularly those represented by the posterior division. This division, comprising the long muscles of the back, their aponeuroses and periosteal insertions and their muscle sheaths and superficial ligaments, indeed forms one physiologic unit. Here belong, aside from the long muscles of the back and their insertions, filling the sacral triangle, the tendinous attachments of the gluteus maximus and the tensor fasciae, as well as the long posterior sacro-iliac ligaments, the ligamentum sacrospinousum, the ligamentum sacrotuberousum and, indirectly, the piriformis. (The last named bears anatomic relations to the sacrotuberous ligament, from which some of its fibers take their origin [Freiberg⁴²]). Tension is transmitted to the whole system either by contracture of the muscles of the back (forward flexion test) or by stretching of the hamstrings (Lasegue's sign), and it is significant that Lasegue's sign is negative in cases of true neuritis and in tumor of the cord and positive in cases of fibrositis and myofascitis of the muscles of the back.

TABLE 3—Patients with Pain Low in the Back Treated by Surgical Methods

Operation	Number of Patients	Radiations of Pain				Local Post-Tend	Operative Results		
		Sacrum and Gluteus	Gluteus and Posterior Part of Thigh	Gluteus Thigh and Leg	Secondary Scoliosis		Good Results	Improvement	No Relief
Tensor fasciotomy (Ober)	10	1	3	6	6	10	6 (60%)	2 (20%)	2 (20%)
Excision of spinal process or ligament	5		3	2	1	5	4 (80%)	1 (20%)	
Transversectomy	3		1	2	2	3	2 (66%)	1 (33%)	
Stripping of posterior superior iliac spine	3			3	2	3	3 (100%)		
Sacro iliac fusion	1		1	1	1			1 (100%)	
Sacrolumbar fusion	5		2	2		4	4 (80%)	1 (20%)	

One would expect a large portion of cases of low back pain to belong to the posterior syndrome group. First the pain involves the nearest structure put under strain in cases of trauma and the first one to give under continued stress in the postural and degenerative group. Furthermore, in the absence of definite facts concerning the pathologic process, one can point to analogies for the traumatic and the degenerative arthritis of the posterior syndrome of sprain of the neck muscles, with radiation along the greater occipital nerve, the tennis elbow, a definite localized lesion at the origin of the

- 41 Ingebrigtsen R Acta chir Scandinav 65 283 1929
 42 Freiberg A H Ohio State M J 30 21 (Jan) 1934

extensor carpi radialis brevis with radiation down the forearm, the injuries to tendons of the rotators of the arm in subacromial bursitis, with radiation upward to the neck and downward to the forearm into remote dermatomes.

In the majority of cases of posterior musculo-aponeurotic or ligamentous involvement, one can locate a definite point of tenderness in the sacral triangle—posterior superior spine posterior crest posterior inferior spine posterior sacro-iliac ligament and apex and base at the sacrolumbar joint lateral from the sacral triangle—the lines of origin of the gluteus maximus, tensor fasciae and greater sciatic notch (fig 3). Frequently there is diffuse tenderness (hyperesthesia) within the muscle sheath as distinguished from the point of tenderness of the periosteal ligamentous lesions. Many patients, especially those with a positive Ober sign show also a superficial midgluteal point of tenderness, not too well defined but in almost all instances associated with a well localized tender point lateral to the posterior superior spine. The gluteus maximus fascia (fascia lata) intimately adheres to the long posterior sacro-iliac ligament then passes upward to the posterior superior spine and the crest of the os ilei. Before reaching the crest it takes a secure attachment (with most of its fibers) to the superior gluteal ridge. It is here that the lesion seen on the lateral aspect of the posterior superior spine may be located.

There is a syndrome involving the deep posterior division, that is, the deeper ligamentous structures of the sacro-iliac junction, the ilio-lumbar ligament and also the transverse sacral process in cases of sacralization. These structures are supplied totally or in part by the posterior division of the lumbosacral region (Pitkin and Pheasant⁴³). They do not, however, produce the circumscribed pressure points which the more superficial lesion does. On the other hand, the signs referable to the leg become of greater importance, as they may be the only means of eliciting indirectly local tenderness of the deeper structures. So we find such signs indispensable both for the superficial and for the deeper local lesion in the territory of the posterior division, but they are not pathognomonic for any definite localization (Brahdy⁴⁴). Stress transmission by rotation of the os ilei forward (the Nachlas⁴⁵ sign) or backward (Lasegue) occurs over a multitude of structures, the identification of the particular structure involved rests with the local point of tenderness. The Lasegue sign indicates stress transmitted through the hamstrings to the sacrospinalis, the fascial sheath and the posterior sacro-iliac ligamentous apparatus, as well as tension to the sacrotuberous and the sacrospinous ligament. This fact may explain the pressure effect of the piriformis on the sciatic trunk (Freiberg and Vinke⁴⁶). Nutter⁴⁷ expressed the opinion that the constant absence of internal crural involvement seems to preclude direct pressure on the nerve (Pitkin and Pheasant⁴⁸). The neck flexion reaction (Soto-Hall⁴⁹) is not found in cases of injury to soft tissue

In examining the gluteus maximus and medius at their origin from the posterior superior spine, we found nerve filaments running from the posterior superior spine into the muscle. What part do they play in the gluteal syndrome? Apparently they transmit pain and tenderness laterally and distally from the lesion in the posterior superior spine. Also many fibers of the gluteus maximus take their origin from the long posterior sacro-iliac ligament so it is possible that the pull on the gluteus maximus muscle irritates the original point of lesion at the long posterior sacro-iliac ligament.

The Ober sign⁵⁰ denotes contracture of the tensor fasciae. At its lateral border the fascia splits to enclose the gluteus maximus separating it from the gluteus medius as can easily be shown by injecting

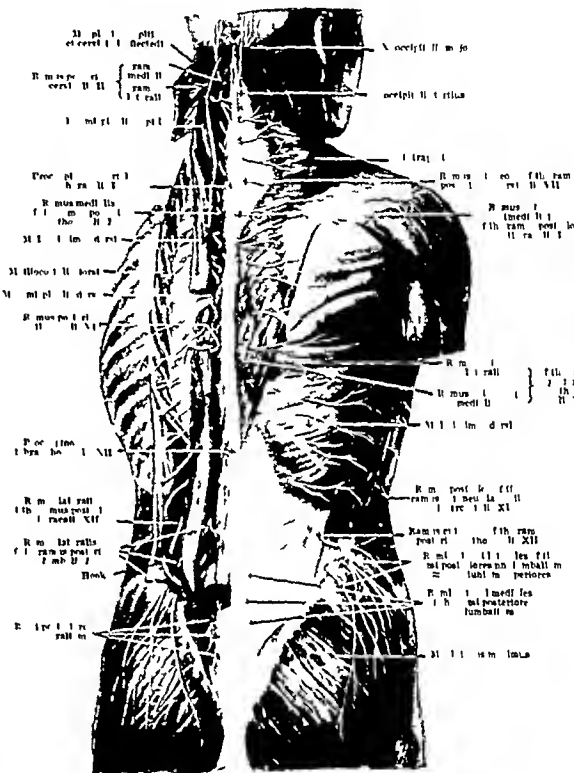


Fig 1—The posterior divisions of the spinal nerves (from Spaltholz Werner Atlas of Human Anatomy Philadelphia J B Lippincott Company)

air under the fascia lata. We find that the superficial layer of this inclosing fascia has a short aponeurotic attachment to the superior gluteal ridge, to which the long posterior sacro-iliac ligament likewise attaches, hence the impossibility of isolating stress to either one of these structures. The "standing" Ober sign is the limitation of adduction of the leg or inability to cross it and denotes contractural posture rather than an original point of the disease.

Interspinous impingement is not uncommon in the sacrum acutum with pre spondylolisthesis and in the long and the broad spinous processes. Baastrup⁵¹ described impingement of the spinous process with formation of nearthroses, flattening of processes and osteosclerosis. Avulsion fractures of the spinous processes have been described (Wachs⁵²) with pseudoarthroses.

43 Pitkin H C and Pheasant H C Sacroarthrogenetic Tetraplegia II J Bone & Joint Surg 18 365 (April) 1936

44 Brahdy Leopold Mechanics of Physical Signs of Lower Trunk Injuries Surg Gynec & Obst 60 802 (April) 1935

45 Nachlas J W Knee Flexion Test for Pathology in Lumbo-sacral and Sacro-iliac Joints J Bone & Joint Surg 18 724 (July) 1936

46 Freiberg A H and Vinke T H J Bone & Joint Surg 16 126 (Jan) 1934

47 Nutter J A Canad M A J 35 11 (July) 1936

48 Pitkin H C and Pheasant H C Sacroarthrogenetic Tetraplegia II J Bone & Joint Surg 18 365 (April) 1936 III 18 706 (June) 1936

49 Soto-Hall Ralph and Haldeman K O Surg Gynec & Obst 61 827 (Dec) 1935

50 Ober F R J Bone & Joint Surg 18 105 (Jan) 1936

51 Baastrup C I Fortschr a d Geb d Rontgenstrahlen 18 430 (Oct) 1933

52 Wachs Emil Fortschr a d Geb d Rontgenstrahlen 52 261 (Sept) 1935

and arthritic bridges. All these lesions may give rise to severe compression of the interspinous ligament and produce strictly localized points of pressure.

POSTURE

Buchholz⁵³ gave the incidence of sciatic scoliosis as 22.7 per cent and the ratio between homolateral and contralateral curvature as 30:67. On the other hand, Pitkin⁵⁴ gave the incidence of heterolateral curvature as 45 per cent and of homolateral curvature as 47 per cent and observed no list in only 8 per cent of his patients. We cannot agree that sacralgic tetalgia is always accompanied by scoliosis as we have seen many patients without list. Nor have we been able to observe a characteristic pattern to differentiate sacral and iliac "slip" (Pitkin). In the majority of cases the spine is shifted to the side opposite the lesion, i. e., with the lumbar convexity at the side of the lesion and the thoracic

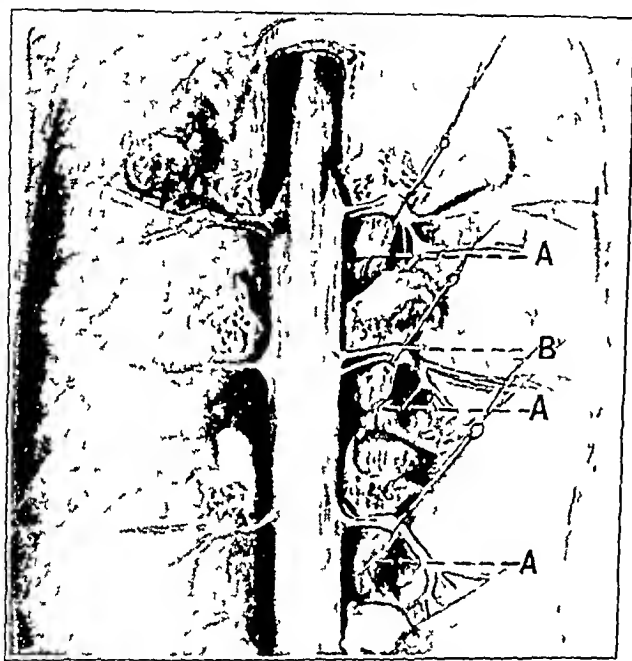


Fig. 2—Di section of the nervus sinuvertebralis lower dorsal and upper lumbar regions. A, nervus sinuvertebralis; B, dorsal root ganglion.

list on the opposite side. This lowers the pelvis on the affected side, placing the hip in adduction. We believe that in patients with a positive Ober sign the contracture is secondary to the scoliosis and the accompanying drop of the pelvis the syndrome persisting because of the resulting tension.

PROCAINE HYDROCHLORIDE TEST

Recognizing that this triad of symptoms, namely local tenderness, radiation and faulty posture, must apply for the posterior as well as for the anterior division syndrome, our objective was first to single out from a series of 451 patients seen in the last fifteen months those in whom a definite localized source of pain was found by palpation and in whom the leg signs consistently referred to this localized tender point. The structures involved are all supplied by the posterior division of the spinal nerves. We next tried to establish the relation of this local point to radiation.

The test is made by injecting into the area of local tenderness from 5 to 10 cc of a 1 per cent solution of procaine hydrochloride. The point is first marked by

a silver nitrate stick and the skin over it is anesthetized with a few drops of the procaine solution. Then the needle is inserted deeply and the involved tissue identified by a definite sensation of prun when the point of the needle comes in contact with it. Sometimes the operator has to feel his way until he strikes this point.

Five postulates must be met to furnish proof that a causal connection exists between local pain and radiation.

- 1 Contact with the needle must aggravate the local pain.
- 2 Contact with the needle must elicit or aggravate radiation.
- 3 Procaine hydrochloride infiltration must suppress local tenderness.
- 4 Procaine hydrochloride infiltration must suppress radiation.
- 5 The positive leg signs must disappear.

When all five requirements were met, we considered that the patient reacted positively to the test and that the radiation was a reflex phenomenon elicited by the local lesion.

For this series only patients were used who were seen in the fifteen months after the study began. Excluding 142 patients with arthritis or the combined anterior and posterior division syndrome, we found deep ligamentous injuries in 114 and myotendinitis in 104 (Albee⁵⁵), a total of 228. When we further eliminated patients in whom there was no primary definite localization, for instance in postural cases, there remained 145, or about 30 per cent who definitely showed the posterior division syndrome and in whom we suspected that the radiation was a reflex and not a root compression phenomenon (table 1).

It is shown in table 2 that the positive response arranged according to primary source of pain (pressure point), were as follows: posterior superior spine, 14; lateral, 47; 74 per cent; posterior superior spine, medial, 17; 60 per cent; lumbosacral junction, 8; 61 per cent; transversosacral articulation, 7; 81 per cent; supraspinous and interspinous ligament, 13; 93 per cent; and lumbodorsal fascia, 8; 90 per cent. That is 100 of 145 patients, about 70 per cent, gave a positive response.

These figures represent a minimum percentage. It is likely that some cases were missed because the involved area was not closely enough identified by the inserted needle. Sometimes a good deal of testing is needed before the exact point reveals itself by definite pain and aggravation of the radiation.

TREATMENT OF THE POSTERIOR SYNDROME

Although the question of treatment is beside the scope of this paper, we believe that from the establishment of a definite posterior division syndrome for pain low in the back certain therapeutic inferences may be drawn.

1 It may be expected that the strains of the muscular aponeurotic structures will yield to conservative treatment by immobilization and physical therapy in a manner similar to that in which strains of these structures yield in other locations of the body. Of the 142 patients with the posterior division syndrome 103 were treated satisfactorily by conservative methods. This is more than the number of positive responses, which shows that in some cases positive responses should have been obtained but were missed because of insufficient testing with procaine hydrochloride.

2 Of the remaining thirty-nine patients who did not yield to conservative treatment, nine with coccygodynia and pain low in the back were eliminated leaving thirty patients with low back pain to be treated surgically (table 3).

The reasons why they did not yield to immobilization were threefold:

1 Persistence of aponeurotic tension Ten patients had Ober's operation 60 per cent were cured and 20 per cent improved Three had stripping of the posterior superior iliac spine, all were cured

2. Pinching or impingement of soft structures. On five patients with impingement of the interspinous ligament, resection of the spinous processes was performed, 80 per cent were cured and 20 per cent improved.

3 Inability to immobilize—A palliative operation of internal fixation was performed on six patients by sacro-iliac and sacrolumbar fusion. 67 per cent were cured and 33 per cent improved.

KLPOI T OF CASLS

CASE 1—*Sacrospinal syndrome*. In B. S. aged 21 admitted Feb. 11, 1937, the acute onset February 3 followed a fall. There was tenderness in the medial aspect of the right posterior superior spine and radiations to the posterior part of the right thigh. Leg signs were positive on the right. The spine was straight.

Procaine hydrochloride was injected into the medial part of the right posterior superior spine. Radiations were reproduced by the touch of the needle. Relief lasted two hours the motions being normal and the leg signs negative. The condition was cured by support.

CASE 2.—*Supraspinous and interspinous ligament syndrome*
In M M aged 34 admitted Dec 28 1931 the onset was sudden eleven years before after a fall. There was tenderness in the supraspinous ligament of the fourth and fifth lumbar vertebrae. The radiations were bilateral but worse on the right, going down to the heels and the posterior part of the thigh and leg. Leg signs are mildly positive on the right with straight leg raising (hyperextension of the spine caused severe pain).

Procaine hydrochloride was injected at the site of tenderness in the supraspinous and interspinous ligaments of the fourth and fifth lumbar vertebrae. Radiations were reproduced by needle touch. All local and radiating pain was relieved for two hours and hyperextension of the spine was painless.

Conservative treatment was of no avail. March 6, 1937 excision of the impinging points of the fourth and fifth lumbar vertebra was done. Complete relief followed.

CASE 3—*Lumbosacral joint syndrome*. In E. V. H. aged 35 admitted April 17, 1936 the onset in December 1935 was insidious. There was tenderness in the left lumbosacral joint and the coccyx. Leg signs were positive on the left. The spine was straight. There were radiations not severe down the posterior part of the right thigh the lateral aspect of the left leg and the posterior part of the right thigh.

The first two injections of procaine hydrochloride were superficial and gave little relief. The third injection was at the level of the left lumbosacral joint and gave relief for about an hour. Radiations were reproduced in the point of the needle and then relieved. Leg signs were negative after the injection. X-ray examination showed a transverse defect in the inferior articular process of the fifth lumbar vertebra.

No relief was obtained by conservative means and May 8 1937, lumbosacral fusion was done.

CASE 4—*Lumbodorsal fasciitis syndrome*. In R. J., aged 38 admitted March 12 1957 the onset was sudden one year previously while he was lifting. There were no radiations. The tenderness was superficial and to the left of the fifth lumbar vertebra. Leg signs were negative. The spine was straight.

On injection of procaine hydrochloride there was first hyperesthesia of the fascia at the site of tenderness (the point of the

needle caused severe pain) then complete relief was obtained for two hours. The mobility of the spine was normal after the injection. The roentgenograms revealed nothing abnormal. The patient was treated by physical therapy.

CASE 5—*Gluteal myofascial syndrome*. In V. R., aged 45, admitted Aug. 17, 1936, the onset was insidious ten months before. There was tenderness over the lateral aspect of the right posterior superior spine and the right midgluteal point with radiations down the posterior part of the right thigh and the lateral part of the right leg and foot. Leg signs were positive on the right except Lasègue's sign. The spine shifted slightly to the left.

On injection of procaine hydrochloride at the lateral aspect of the right posterior superior spine radiation was reproduced by needle touch then for two hours relief of radiation and local symptoms. Motions became normal and the leg signs negative. Posture became normal.

No relief was obtained by conservative treatment. March 11, 1937 the lateral aspect of the right posterior superior spine was stripped. The operation gave complete relief.

CASE 6—*Gluteal myofascial syndrome*. In W. F. aged 21 admitted in November 1936 the onset had been insidious. The tenderness was well localized lateral to the right posterior

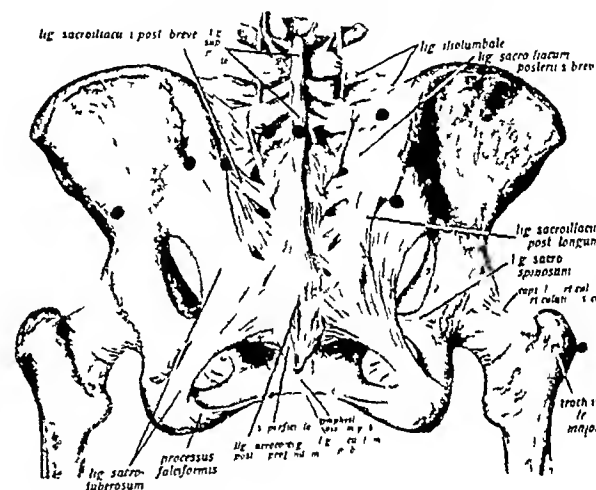


Fig. 5.—The common pressure points of the superficial structures of the lower part of the back.

superior spine. There were radiations down the posterior part of the right thigh and the lateral part of the right leg and foot. Leg signs were positive on the right except Lasègue's sign.

Needle touch reproduced radiation at the later il aspect of the posterior superior spine on injection of procaine hydrochloride. The leg signs became negative, and the local and the radiating pain was temporarily relieved. The condition was relieved by support.

CASE 7—*Acute gluteal myofascial syndrome*. In R. B., aged 55, admitted March 26, 1937, the onset was acute; the patient was seen four hours afterward. The tenderness was well localized just lateral and superior to the left posterior superior spine. There were radiations down the posterior part of the left thigh and the leg signs were markedly positive on the left except Lasègues sign. The patient could hardly move because of pain.

Procaine hydrochloride 3 cc of a 1 per cent solution injected at the tender point lateral to the left posterior superior spine reproduced the radiations well. Relief lasted several hours and the leg signs became negative. The patient was amazed at the spectacular relief. The injection was repeated daily for three days and cure followed in about one week.

Case 8—*Transversosacral arthritic syndrome*. In W. A. aged 18 admitted Aug. 22 1935 the onset at the age of 12 had been insidious. The tenderness was over the left transversosacral point. Radiations down the posterior part of the

left thigh and leg were severe. Leg signs were positive on the left. The spine showed a marked shift to the right with left lumbar, right dorsal scoliosis.

Procaine hydrochloride was injected at the left sacralized transverse process. The radiations were reproduced by the needle. Relief lasted one hour, with full motion of the spine, improvement of the posture and disappearance of the leg signs.

Conservative treatment gave no relief. A left transversectomy performed March 2, 1937, gave relief.

CASE 9—Left transverso-sacral arthritis, bilateral sacralization of the transverse processes. In B. H., aged 21, admitted Feb. 17, 1937, the onset three months before had been gradual (back "always weak"). The pain was worse in the morning, with changes of weather and after exercise. There were tenderness directly over the left transversosacral joint and radiations down the posterior part of the left thigh. Leg signs were positive on the left. The spine showed a slight shift to the right, with left lumbar, right dorsal scoliosis.

Procaine hydrochloride was injected at the level of the left transversosacral point. Radiations were reproduced by the point of the needle. Relief from radiating and local symptoms was obtained for about one hour, the leg signs became negative and the posture was improved.

The condition was treated by a brace. The patient was relieved but unable to work.

CASE 10—Tensor fasciae syndrome, Ober operation. In M. G., aged 48, admitted Sept. 20, 1929, the sudden onset followed wrenched back. There was tenderness over the lateral aspect of the left posterior superior spine and the left mid-gluteal point. There were radiations down the posterior part of the left thigh. The Ober and the straight leg raising sign were positive on the left. No procaine hydrochloride was injected.

No relief was obtained from conservative treatment. Dec. 5, 1934, lumbosacral and sacro-iliac fusions were performed, but they gave no relief. Feb. 2, 1936, a tensor fasciotomy was done. The tensor fascia was very tight, almost bone hard when tense. The separation was about 2 inches when sectioned. This operation gave relief, and the patient does hard work.

CASE 11—Tensor fasciae syndrome, Ober operation. In J. B., aged 46, admitted Dec. 13, 1934, the onset had been sudden four years previously after a short fall. There were tenderness lateral to the right posterior superior spine and at the right midgluteal point and radiations down the posterior part of the right thigh. Leg signs were positive on the right, Ober's sign was positive on the right.

Procaine hydrochloride injected lateral to the right posterior superior spine relieved the radiations and the local pain for two hours.

No relief was obtained from conservative treatment. An Ober fasciotomy gave relief (the patient had tight fascia). The patient has occasional pain, not severe, lateral to the posterior superior spine.

COMMENT

We believe that the allocation of the source of pain due to disorders low in the back offers a distinct advantage for the management of the disorder. This allocation is thoroughly feasible in the large number of cases in which the trouble involves structures supplied by the posterior division of the spinal nerves, because the seat of pain is either accessible to the palpating finger or reveals itself by transmission through the leg test or both. We have attempted to show by the procaine hydrochloride test that both local pain and radiation are in causal connection and that radiation may be elicited by an area of local pain as a reflex symptom without being caused by root compression. This theory does not by any means reject true root compression neuralgias as they occur with arthritis or with special pathologic conditions of the lumbosacral level. We merely furnished proof that in the large group of cases of the posterior division syndrome such

radiation is a reflex phenomenon, because it can be suppressed together with the local pain by the injection of procaine hydrochloride.

ABSTRACT OF DISCUSSION

DR WILLIAM BARNETT OWEN, Louisville, Ky. The authors' attempt to differentiate pathologic conditions in the territory of the posterior from those in the territory of the anterior lesions of the lumbosacral process is most interesting. It appears that they have had a sufficient number of cases over a period of time to reach certain definite logical conclusions. Any clinical or therapeutic test that helps to localize more definitely the origin of the pathologic condition represents a substantial step forward in the final successful outcome in the case. Take for instance a triple arthrodesis, i. e., fusion of both sacro-iliac joints and the lumbosacral joint for pain low in the back. That is a procedure that is seldom, if ever, justifiable. It is like shooting at a target with a 10 gage shot gun instead of a rifle. One is hoping that one of the shot may strike the pathologic condition. In other words, it is more important to take a great deal of time and study to make a definite localization before any radical procedure has been instituted. In the meantime, one should continue with conservative treatment, as the authors have shown. A very large percentage of all pain in the lower part of the back can be relieved by rest, support, postural training and the usual conservative methods. There have been many valuable contributions in the past ten or fifteen years on low back pain. I feel that we have begun to learn something. The more we learn for certain, the less will be written. Take for instance, typhoid, smallpox and diphtheria. There is much known for certain about these diseases, so the journals have had a rest. I feel that the authors have made a distinct contribution. I am sure that if we intelligently employ the procaine localization test, it will greatly assist in making a diagnosis.

DR A. R. SHANDS JR., Durham, N. C. The authors have presented a new approach to the diagnosis of one of the most puzzling of orthopedic problems. Many physicians have known for a long time that the differential diagnosis of disorders in the lower part of the back have not been accurate. Discarding the old horizontal classification of sacro-iliac and lumbosacral disorders for a vertical classification of anterior and posterior spinal nerve areas is a distinct innovation. The authors have given an excellent analysis of the nerve supply to the muscles in the lower part of the back. The five postulates which they lay down in the proof of the connection between the local site of tenderness and radiating pain are most important and necessary for the correct diagnosis. The figure of 70 per cent positive responses in 142 cases of posterior nerve division is impressive and should convince the doubtful mind that the procedure is sound. Even though they do not go far into the treatment of these disorders, it is certainly most gratifying to hear that 72 per cent of these posterior division cases yielded to the conservative measures of physical therapy and immobilization. It is assuredly true that during the last ten years we have passed through an operative period for pain in the lower part of the back. Many are beginning to realize the futility of some of these procedures and are finding that many of these low back patients who have been operated on remain unimproved. Some of the most dramatic operative results for the relief of low back and radiating pain that I have ever seen were ten years ago following a Smith-Petersen sacro-iliac arthrodesis. How many of these are still relieved of pain cannot be said, but no doubt there have been many recurrences. Dr. Ober and now Drs. Steindler and Luck have well demonstrated that stripping the fascia lata from its posterior iliac attachment, which is done in his sacro-iliac arthrodesis, is probably the real reason the patients are relieved of the pain. During the past wave of lumbosacral and sacro-iliac fusions I am convinced that too much attention has been paid to these joints and not enough attention to the impingement of the transverse processes on the sacrum and ilium, and the impingement of the spinous processes on one another. Drs. Steindler and Luck, in their localization with procaine, have demonstrated the true pathologic condition in many of these cases. I believe that physicians would all do well to think more carefully along the lines that the authors

have outlined and attempt to localize the lesion before proceeding with treatment in low back pain syndromes

DR ARTHUR STEINDLER, Iowa City I have nothing more to say except to thank the discussors, particularly since we consider this paper merely a study in diagnosis and not a study in treatment. We have been forced to admit that sciatic pain in a large percentage of cases has nothing to do with organic compression of the sciatic nerve but is transmitted through a reflex nerve passage probably going through the spinal cord. The important part is that when one has established a causal connection between a local peripheral lesion and what appears to be sciatica there is no use of looking up the nerve tract of the sciatic trunk or the sciatic roots. Particularly I think we shall have to break sooner or later with the idea of local compression of the funicular or radicular type, at least for a certain number of those cases in which this particular pathologic condition was accused of being the underlying cause.

TENDOPLASTIC AMPUTATION THROUGH THE FEMUR AT THE KNEE

FURTHER STUDIES

C LATIMER CALLANDER, M.D.
SAN FRANCISCO

A year and a half has elapsed since this tendoplastic amputation through the femur at the knee was introduced in *THE JOURNAL*.¹ A sufficient number of additional cases are available to warrant a resurvey of the factors presented in the initial paper. Experience at the University of California Surgical Division of the San Francisco Hospital and that of co-workers and surgeons elsewhere have suggested some slight changes in technic. With data on operative indications, matters of technic and points of criticism, this paper brings the status of this amputation through the femur up to date.

In the Surgical Section of the Exhibit Hall there was an exhibit of surgically planned dissections, mounted for permanent preservation by a method devised by two associates, Dr J. M. Saunders and Dr A. H. Rice of the University of California Medical School and executed by our technical assistant, Mr Rudolph Skarda. This paper is illustrated by photographs of the operative stages, which may be compared with the detailed halftone drawings in the original paper.¹

After repeated personal experience with the surgical principles embodied in this operation, and discussion of these principles with many surgeons over the country at large, I believe we are justified in maintaining this type of operation in our surgical armamentarium.

The essentials of the operation are given in summary. The details of the operative procedure are presented, with the changes and additions indicated by recent experience. The features of this procedure are contrasted with those of other types of amputation in the lower third of the femur.

SYNOPSIS

Briefly the operation is performed as follows. The anterior flap is fashioned from the soft tissues of the upper part of the leg as far distally as the level of the tibial tuberosity, the posterior flap is longer than the anterior, and it extends well down on the gastroc-

nemius muscle. The popliteal vessels and nerves are ligated through an amuscular and avascular cleavage plane on the medial aspect of the lower part of the thigh. All the hamstring muscles are severed at their tendinous insertions on the tibia and the femur is sectioned in the condylar flare just proximal to the adductor tubercle. The patella is dissected from the anterior flap from the joint side, leaving the rectus femoris tendon in the floor of the patellar fossa to act as an end-bearing buffer for the femur. No coarcting primary sutures are used save from four to six skin clips or sutures to hold the flaps roughly in position.

As the edges of the flaps unite the posterior flap retracts gradually but extensively until the femur occupies the patellar fossa snugly and the suture line is located well up behind the stump end.

DESCRIPTION OF OPERATION

The patient is placed in the dorsal decubitus position, the knee of the affected extremity is flexed slightly and the leg is elevated a little above horizontal on one or two sandbags. No tourniquet is applied. The surgeon stands on the side opposite the affected extremity and faces the medial aspect of the thigh and knee to be operated on. He maintains this position throughout the operation because the essential steps are directed through a medial approach to the popliteal space. The operative work on the lateral aspect of the lower part of the thigh and knee is accomplished readily by rotating the knee medially.

The incisions in the skin outlining the slightly unequal anterior and posterior flaps coincide with the



Fig 1.—Medial surface of the left thigh and knee showing skin incisions on the medial side of the lower part of the thigh and the knee marking the long anterior and posterior flaps. Attention is directed to the amuscular and avascular interspace between the vastus medialis and the sartorius muscles. The flaps for this amputation are derived partly from the soft parts of the leg.

incisions that cover all the deeper soft parts (fig 1). The incision on the medial aspect of the thigh begins at a point three fingerbreadths proximal to the most prominent part of the medial femoral condyle and runs horizontally distally in the palpable groove between the vastus medialis and the sartorius muscles. With the knee in partial flexion this groove can be defined readily. After the incision has been deepened to the enveloping or deep fascia of the thigh, the adductor tubercle of the medial femoral condyle and the tendon of the adductor magnus muscle, which inserts on it, can be palpated. The incision in the skin continues distally over the medial epicondyle, sweeps forward and crosses the anterior surface of the tibia at the anterior tibial tuberosity, the point of insertion of the quadriceps extensor tendon.

From the University of California Surgical Division of the San Francisco Hospital.

Read before the Section on Surgery, General and Abdominal at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1937.

1. Callander, C. L. A New Amputation in the Lower Third of the Thigh. *J. A. M. A.* 105: 1746-1753 (Nov. 30) 1935.

The thigh then is rotated medially (i. e. toward the surgeon). The incision on the lateral aspect of the leg begins at a point three fingerbreadths proximal to the lateral femoral condyle in the palpable groove between the tendon of the tensor fasciae latae (iliotibial tract) and the biceps femoris muscles. This incision must overlap and split the tensor fasciae latae tendon in order to avoid the muscle fibers of the biceps. Con-

portion lying between the vastus medialis and the sartorius muscles) is deepened through the deep fascia of the thigh (fig 2A). Division of this powerful fascial layer which is the only strong structure in the medial wall of the popliteal fossa at this level affords ingress to the popliteal space. The left forefinger now inserted into the superficial popliteal space, by blunt dissection frees the medial hamstring tendons as far

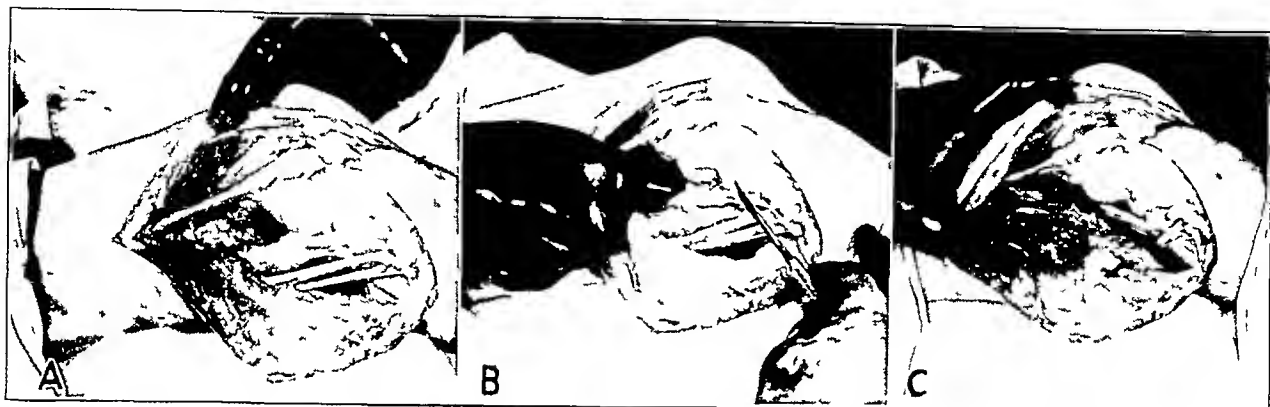


Fig 2—Medial surface of the left thigh and knee (only insertions of these tendons should be exposed at operation). A the medial vastus muscular compartment has been opened only to show its contents. Three of the four hamstring tendons have been dissected to show their course and insertion. The sartorius tendon has been cut and reflected with the posterior flap. Attention is directed to the tendon of the adductor magnus muscle inserting on the adductor tubercle. B a finger is inserted into the popliteal space and has bunched the medial hamstring tendons prior to severing them at their tibial attachment. C the medial hamstring tendons have been divided at their tibial insertion and can be seen in the posterior flap. The popliteal artery and vein are exposed.

tinuing distally over the lateral epicondyle the incision extends forward to meet the medial incision at the anterior tibial tuberosity thus outlining the anterior flap of the amputation.

Corresponding incisions from each femoral epicondyle are carried obliquely posteriorly and inferiorly until they meet on the calf of the leg at a point considerably inferior to the level of the anterior tibial tuberosity at about the midpoint of the belly of the gastrocnemius muscle. This incision for the posterior

as their tibial insertions. At this juncture these tendons are divided in the order named sartorius, gracilis, semimembranosus and semitendinosus (fig 2B). During this dissection no fleshy portion of any of the medial hamstring muscles nor any part of the vastus medialis muscle need be exposed much less severed. The severed hamstring tendons retract at once into the aponeurotic and areolar tissue of the posterior flap and are not dealt with again. Further exposure is gained by severing the tendon of the adductor magnus

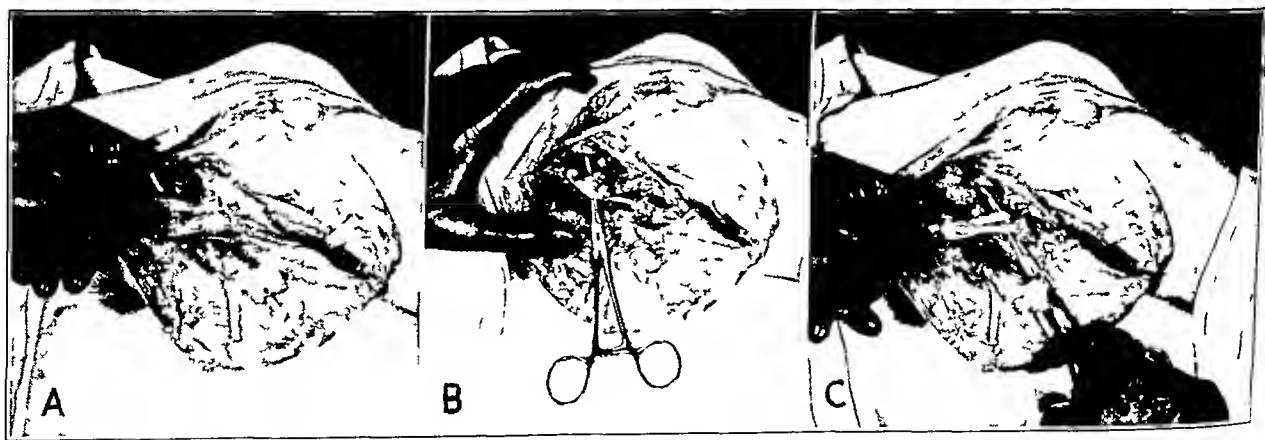


Fig 3—Medial surface of the left thigh and knee. A the popliteal artery and vein are withdrawn from the fossa prior to ligation. B the popliteal artery and vein have been ligated. The popliteal termination of the sciatic nerve has been drawn from the depths of the popliteal space preparatory to anesthetization, ligation, division and injection with absolute alcohol. C the sciatic nerve has been doubly ligated proximal to its division into the popliteal and common peroneal branches.

flap is deepened to the fascia on the gastrocnemius muscle. Thus are outlined two long amputation flaps, the posterior a little longer than the anterior. Each flap partakes not only of the soft parts of the lower thigh but of a considerable portion of the soft parts of the leg.

Attention is then centered again on the medial aspect of the thigh and knee. The horizontal portion of the medial incision common to the two flaps (i. e. that

muscle at its attachment to the adductor tubercle. Free access to the basculoneural contents of the popliteal space thus is afforded (fig 2C). Moderate flexion of the knee relaxes the popliteal vessels and nerves and favors their manipulation. With a finger now inserted more deeply into the popliteal space and kept close to the posterior surface of the femur, the popliteal artery and vein are withdrawn easily to a level flush with or even outside of the incision in the skin (fig 3A).

Here they are clamped, ligated and divided as far distally in the popliteal space as possible. The tibial (internal popliteal) and common peroneal nerves are then drawn readily into the wound as one trunk and are anesthetized, ligated and divided (fig 3B). Each of the components of the nerve bundle then is injected with absolute alcohol to prevent formation of neuroma and the stump is allowed to retract into the proximal recess of the popliteal space (fig 3C). Ligation of these three essential structures low down in the popliteal space prevents unnecessary separation of the posterior flap from the femur and minimizes formation of dead space.

The partly flexed knee then is rotated toward the operator and the lateral longitudinal incision is deepened through the more posterior fibers of the tensor fasciae latae tendon (fig 4A). This incision is carried inferiorly as far as the insertion of the biceps muscle on the head of the fibula where the biceps tendon then is severed (fig 4B). At this stage of the operation the popliteal space may be opened widely from side to side since the essential structures have been divided. Deepening of the incision outlining the posterior flap down to the gastrocnemius aponeurosis and clearing from it the areolo-adipose debris, free the posterior flap. It is advantageous to leave as much as possible of the fibro-areolar tissue of the popliteal space

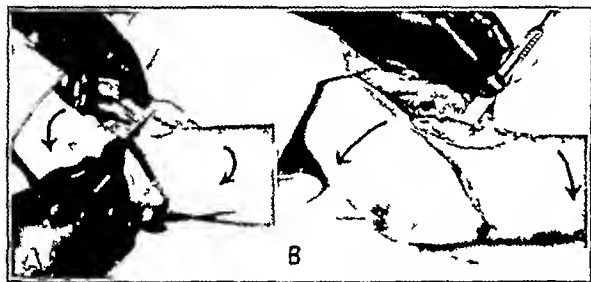


Fig 4—The lateral surface of the left thigh and knee. A the knee has been rotated medially (toward the operator). The biceps muscle and tendon are isolated prior to section of the muscle at its insertion on the head of the fibula. B the knee is rotated medially toward the surgeon. The biceps tendon has been severed. The knife blade elevates the common peroneal nerve which already has been sectioned in the medial approach (fig 3C).

in contact with the femur as far distally as the level of the adductor tubercle in order that there may be but little dead space between the posterior flap and the femur.

The knee then is extended and the incision marking the distal portion of the anterior flap is deepened through the capsule of the knee joint down to the femoral condyles and to the tibia thereby severing the quadriceps tendon at its insertion into the tibial tuberosity. The anterior flap containing the patella, is dissected upward off the infrapatellar fat pad and drawn upward on the thigh until the superior synovial recesses of the subquadriceps space are seen (fig 5A). The patella is dissected from the apex to the base from its sesamoid position in the quadriceps tendon care being taken to preserve the longitudinally disposed tendon of the rectus femoris muscle which runs over it (fig 5B). Preservation of this tendon adds materially to the end-bearing capacity of the stump after the cut end of the femur is fitted into the socket from which the patella has been removed. The synovia on the anterior flap and on the femur proximal to the condyles is not excised. The femur now is saved through its cancellous portion just proximal to the adductor tubercle (fig 6A). At this level the shift of the

femur corresponds in size to the patella socket in the quadriceps tendon (fig 6B). The cut end of the femur is rounded with a bone-cutting forceps and rasped until no sharp surfaces and no fringes of periosteum remain.

The two large flaps are inspected for small bleeding points. These can be ascertained best by sluicing the surfaces of both flaps with large quantities of warm

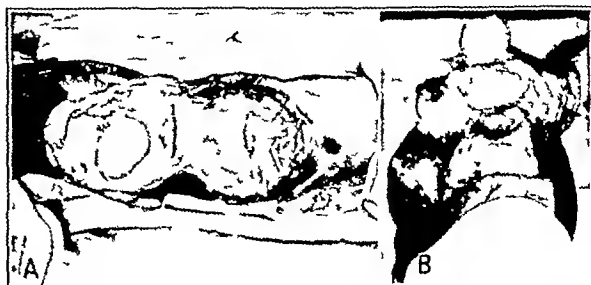


Fig 5—Anterior surface of the left thigh and knee. A the anterior flap has been fashioned and turned upward. Note that the fat pad is dissected from the anterior flap. B the anterior flap has been fashioned and turned upward and the patella dissected from its fossa from the base toward the apex of the bone. It is easier to dissect it from the apex to the base. Note the longitudinally disposed fibers of the rectus femoris tendon in the floor of the patellar fossa after removal of the sesamoid patella.

salt solution. The flushing has the additional advantage of washing away any soft tissue or bone debris. Many small bleeding points may require ligation after this procedure. Inspection of the body of the posterior flap shows no muscle fibers. It does show areolo-adipose tissue and the cut ends of the hamstring tendons which already are retracted into their aponeurotic beds and scarcely are visible. The flaps now are allowed to fall loosely together (fig 7A).

The coaptation suturing during the operation is limited to the placing of six or eight clips or sutures at such intervals as to keep the flaps in fair apposition. When the edges of the skin are approximated the aponeurotic edges also lie in contact, mere apposition is sufficient to produce firm union. None of the tendons or aponeuroses of the anterior flap are sutured to the corresponding structures of the posterior flap. In this way no structure is under any tension and the trauma and consequent pressure necroses which result



Fig 6—A medial surface of the left thigh and knee. The anterior flap from which the patella has been dissected is turned upward. The sawline in the femur just proximal to the adductor tubercle is indicated. B medial aspect of the amputation. When the anterior flap is turned down the patella fossa will overlap the cut end of the femur.

from suture of these deeper structures cannot occur. The flaps appear exceedingly long and even extend one or more inches beyond the end of the femur immediately after they are fashioned. To the surgeon accustomed to the routine type of amputation in the lower third of the femur the flaps appear excessively redundant and clumsy and arouse suspicion that a bulbous stump end and large dead spaces will result. When

he notes how wobbly the femur lies between the flaps, he questions whether the end will gain contact with the patellar socket and fuse there. As early as the second or third postoperative day and sometimes even within a few hours after the operation, the reason for leaving these flaps under no tension becomes apparent, as the hamstring muscles, severed only at their distal attachment, contract to the degree that the cutaneous suture line lies posteriorly at about the level of the stump end, and the femur is felt in the patellar fossa (fig 7 B).

POSTOPERATIVE CONVALESCENCE

After the operation the stump is wrapped snugly in a gauze roll on a short splint, and the patient is returned to bed. He is able to sit upright in bed in the evening of his operative day and can be placed in a wheel chair during the next day or two. Daily dressings are required because an abundant serosanguineous oozing between the edges of the skin takes place for several days in spite of the most meticulous hemostasis. The drainage gradually lessens. The absence of primary suturing, other than that necessary for approximation of the flaps, minimizes the pocketing accumulation of

soft parts of the stump (fig 8). There is excellent end bearing, because of the presence of the rectus femoris tendon, the elements of the prepatellar bursa and tough skin over the end of the bone. The patient can extend his stump powerfully, a requisite in any amputation in the thigh.

COMMENT

Objections to certain features of the older types of amputation in the thigh led to an attempt to synthesize an operation which would minimize the difficulties. The operation described has embodied a new application of surgical and anatomic principles.

Vascular Considerations—The customary use of a tourniquet is purposely omitted because the pressure it exerts, for the time necessary, may provoke thrombosis where none was present. In many cases of vascular damage in which amputation is required, extensive thrombosis often is present, and the use of a tourniquet may exacerbate the condition. Through the direct medial approach the popliteal vessels can be secured easily without the use of a tourniquet. Both the artery and the vein are practically devoid of branches for a

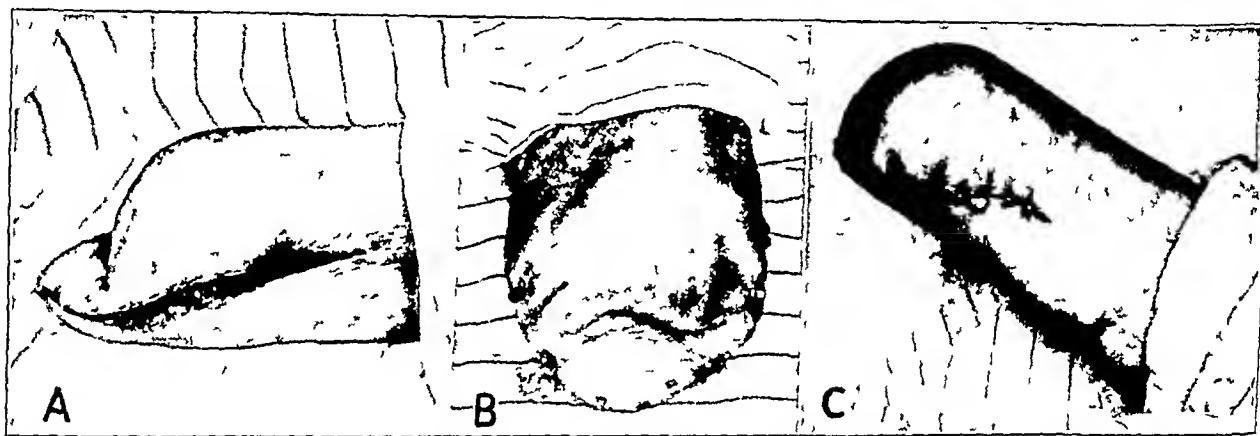


Fig 7—A, side view of the amputation flaps in place before suture. Notice the redundancy of both flaps toward the end of the operation. B, anterior view of the stump. The flaps are merely approximated and the skin is sutured with widely spaced skin clips or sutures. C, the stump after one week. After all drainage has ceased additional skin sutures are placed to obtain better skin coaptation.

fluid and allows all secretions to escape through the wide intervals between the clips or sutures. The major oozing usually stops in from one to three days but sometimes lasts many days. The cause of the excessive drainage sometimes encountered has not been determined. In some of our later cases, after almost all the drainage had ceased we applied skin clips over the intervals between the initially placed sutures. This procedure is warned against, however, as there is great danger that it will cause pocketing accumulation of serum. Serious infection has occurred in several cases, and three patients died. If additional skin sutures are placed late, one must be sure that absolutely all drainage from the interior of the stump has stopped (fig 7 C).

As convalescence progresses, the posterior flap retracts gradually until the suture line, now posterior in position, is well proximal to the end of the bone, occasionally a distance of one or more inches. When it is recalled that the suture line at the end of the operation is an inch or more distal to the end of the bone, it becomes apparent how extensive is the power of the intact hamstring muscles to retract the posterior flap. In a short time the femur is lodged securely in the patellar fossa thus assuring great stability to the

considerable distance, and flexion of the knee allows the main trunks to be brought to the surface for easy ligation.

No explanation has been forthcoming as to why the profunda femoris artery and its terminals so rarely are involved by the pathologic processes which occlude the superficial femoral trunks and their terminals, the popliteal vessels. My co-workers and I have found that the profunda system not only nourishes the thigh but is able to vascularize amputation flaps which extend, as do the flaps in our amputation, well down into the superficial soft tissues of the leg. As evidence of this we often find free bleeding in the long flaps when both popliteal vessels are occluded. Even when little bleeding occurs, experience indicates that the blood supply is sufficient to ensure healing of the flaps.

Length of the Flaps—Too little recognition has been given in the routine amputation at the lower third of the thigh of the extraordinary power of the hamstring muscles to retract and shorten the posterior flap. Practically all of these muscles arise in the pelvis and span a long, uninterrupted course to their insertion on the tibia, and severance of all of them allows retraction which, unless allowed for, will exert more tension than

the suture line will stand. These muscles are cut at their tibial tendon attachments in the operation involving a long posterior flap. Although contraction still takes place, the flaps are so long that firm healing is accomplished before any great tension is exerted on the line of approximation.

The quadriceps muscle components of the anterior flap arise from a considerable portion of the shaft of the femur. In consequence, there is little tendency for this flap to retract, whether the quadriceps tendon is cut in the suprapatellar area as in the routine amputation, or in the infrapatellar portion, as in the endoplastic operation. Section of the iliotibial tract at its insertion on the tibia exerts little traction on the anterior flap because of the shortness of the span of the tensor fasciae latae muscle which activates it. In one case the femur was cut so long and the posterior flap so short that the tension on the anterior flap was sufficient to force the femur to slough through the anterior flap, necessitating skin grafting for repair.

Too short a stump for adequate leverage on a prosthesis is a frequent fault of amputations at the lower third of the thigh. When for any reason a reamputation becomes necessary, the bone is short indeed. No fault is found with the length of the stump obtained by the Gritti-Stokes procedure, but there is difficulty in obtaining bony union between the patella and the femur. It seems probable that the osteoplastic type of amputation would be improved by adoption of the principle of a long posterior flap to eliminate tension at the suture line. Experience suggests that the broad flat surface of the femur at the beginning of the condylar flare is superior to the rounded anterior surface of the patella as a weight bearing surface.

Pyogenic Infection of the Wound—The routine amputation is subject to criticism because of the number of ways it may contribute to pyogenic infection. The short flaps necessitate that initially there be considerable tension on the suture line. This tension increases enormously as contraction of the hamstring muscles takes place postoperatively. This tension favors necrosis, especially in the all too many cases in which *en masse* ligatures approximate the anterior and posterior flaps. Dead spaces without drainage are created by this type of ligature, and debris collected therein becomes infected easily. Seepage from deliberate cross section of hamstring muscle bellies often distends the end of the stump and predisposes to infection. If one were to hold to the routine type of amputation, it would be well in all cases to institute drainage for forty-eight hours.

In the operation described no other sutures than a few at the margins of the skin are used, allowing approximation of the flaps alone to heal the apposed structures. Between the widely spaced sutures any seepage which occurs can drain out readily. As gradual contraction of the posterior flap occurs, the dead spaces present at the end of the operation gradually disappear and drainage ceases. No tissues are under tension and whatever blood supply is present in the flap is conserved to aid healing. By not severing any muscles in their fleshy bellies paths for infection are not opened within their sheaths.

Gas Bacillus Infection—Up to the time this tendoplastic amputation came into use in our hospital gas bacillus infection had occurred after about 15 per cent of the amputations performed because of arteriosclerotic gangrene. Almost all of the patients died.

About the same incidence of anaerobic infection was noted in patients requiring amputation because of diabetic gangrene and half of these died. Gas bacillus infection occurred in the thigh stumps of one third of the patients having gas bacillus infection complicating compound fractures and lacerations below the knee. Two thirds of these patients died. When our tendoplastic amputation was used, gas bacillus infection occurred in the stump of only one of our patients requiring operation because of arteriosclerotic or diabetic gangrene and did not occur in the thigh stump of any patient requiring operation because of peripheral gas bacillus infection. The patient in whom infection occurred had his suture line opened and washed out with diluted solution of sodium hypochlorite. The wound is now ready for secondary closure. These improved results may be attributed to maintaining muscle bellies intact within their sheaths. Leaving the flaps open makes aerobic conditions for the field and prevents incubation of these dread invaders. In at least four cases of distal gas infection, the open type of operation apparently prevented infection in the amputation wound. When the wound is found not to be contaminated the flaps are closed loosely before the posterior flap has retracted to such an extent that closure requires new section of the end of the bone.

Convalescent Period—There is no indication for limiting the patient's activity during the early convalescent period. The routine of having the patient sitting up in bed on the day of the operation and in a wheel chair on the day after the operation reduces the postoperative complications. The short posterior splint used to close dead spaces does not interfere with activity and actually steadies the stump. Freedom from tension at the end of the stump allows free and comparatively painless movement.



Fig 5.—Healed stump. Notice the degree of retraction of the posterior flap. This retraction helps to lodge the end of the femur in the patellar recess.

the day after the operation reduces the postoperative complications. The short posterior splint used to close dead spaces does not interfere with activity and actually steadies the stump. Freedom from tension at the end of the stump allows free and comparatively painless movement.

MORTALITY

I have recorded eighty cases of amputation according to this method, thirty-two are my own and my associates', and the remainder were reported to us from about the country. By far the majority of the patients were over 65 years of age, eleven have died a mortality of 13 + per cent.

450 Sutter Street

ABSTRACT OF DISCUSSION

DR JOSEPH S. MCGUINNESS, San Francisco. Dr Callander should be congratulated on offering his amputation to supplant low thigh amputations where muscle splitting is necessary. We have had nine cases in the past two years at the University Hospital in San Francisco in which low thigh amputations were indicated. In these nine cases we have had one death, the patient dying in the postoperative period from pneumonia. All our patients have had complete occlusion of the artery, but healing occurred in all except the one who died. In the first

three cases we used general anesthesia, but since then we have used a local infiltration directly into the line of the suture, together with injection of 40 cc of 1 per cent procaine hydrochloride into the knee joint. The only other place one need inject is in the periosteum before one divides the bone, and also in the sciatic nerve. This has given us our low mortality in these few cases, because most of the patients have been aged ones with severe vascular complications. We believe this amputation should be accepted instead of the commonly used low thigh amputation because of its low mortality resulting from absence of shock and hemorrhage and because of the fact that in those patients who were generally in good shape there is a good weight bearing end extremity to which an artificial leg can easily be applied.

HEPARIN AND THROMBOSIS

THE PRESENT SITUATION

D. W. G. MURRAY, M.D.

C. H. BEST, M.D.

TORONTO, CANADA

The anticoagulant heparin discovered by Howell and Holt in 1916, has recently been shown to be effective in the prevention of thrombosis of veins produced by various means in experimental animals.¹ When the work on heparin in the University of Toronto was commenced in 1929, it appeared that two main problems had to be solved before the effect of this substance could be studied in human subjects in whom thrombosis was feared. The first was the elimination of toxic material associated with the active principle. The products which were available at that time were not sufficiently innocuous to permit of their injection in large amounts over long periods of time to human subjects. In fact, products much purer than those which were then available have since been shown to possess toxic properties. The problem of purifying the active substance was attacked by our colleagues Charles and Scott,² working in the Connaught Laboratories, and the various fractions that they prepared were administered to experimental animals and some of the purer ones to human subjects. These investigators have recently produced a very satisfactory material of high potency, and Schmitz and Fischer in Germany have had similar success. The results of the use of this purified material in experimental animals and of the preliminary study of its administration to human patients have already been published (Murray, Jacques, Perrett and Best, 1937).⁴ Jorpes,⁵ who has recently made some interesting contributions to our knowledge of the chemistry of heparin has prepared purified material by the method of Charles and Scott. This has been made available to a group of his clinical colleagues who are engaged in a study somewhat similar to that which is in progress in the University of Toronto.⁶ The Swedish workers report that no toxic

results are produced when heparin, made by the method elaborated in Toronto, is administered intravenously to human subjects.

The second problem had to do with the investigation of the effects of heparin on thrombosis produced experimentally. The results of the first study were referred to in the opening paragraph of this article. Quite recently Best, Cowan and MacLean⁷ have shown that in certain species of laboratory animals the formation of white thrombi which regularly takes place when blood is made to pass through glass loops outside the body, is in large part prevented if adequate amounts of heparin are administered. This result is readily demonstrable in dogs, cats and monkeys, and the effect may be shown also in the rabbit. It would therefore appear that a product which can safely be given to human subjects and which is capable of preventing thrombosis in experimental animals is available.

As a result of publication of the recent observations on experimental animals, a great many enquiries have been received from clinicians, and it is hoped that some of the questions raised can be answered here. It is obvious that before any conclusions can be reached with regard to the application of the experimental results to the clinic, a very large number of cases must be studied. While there are a number of clinical conditions in which the effects of heparin might prove of interest, the attempt to influence the incidence of post-operative embolism seemed to us the most satisfactory method of approach to the general problem. Two hundred and twenty-two patients have now received heparin after operation in the department of surgery in this university, but it is obvious that many times this number must be studied before any conclusions as to its efficacy in preventing thrombosis can be reached.

It should be thoroughly appreciated that there is as yet no proof that heparin will prevent the formation of a thrombus in the human subject. We believe that the problem will be advanced most rapidly if the use of heparin is restricted at the present time to clinics where all facilities necessary for the study are available and where accurate records of the incidence of post-operative thrombosis with a reasonably constant type of postoperative care have been kept.

To facilitate the work of other students of this problem the following brief notes on our method of procedure may be given. The heparin solution is added to an intravenous saline drip. Usually 1,000 units⁸ of heparin, i. e. 10 mg., is added to each hundred cubic centimeters of saline solution. The saline and heparin mixture is allowed to run into the vein at such a rate that the clotting time of the patient's blood is maintained at about fifteen minutes, i. e., two or three times the normal value. The results of the studies on dogs justify the assumption that this amount of heparin might exert a definite effect on thrombus formation. The rate of administration of saline solution may be 25 drops per minute but this varies greatly from case to case. The injection of heparin is now being restricted to those cases in which very extensive surgical procedures have been carried out. The injection is continued for varying periods up to fourteen days after the operation. The level of the clotting time of the

From the Department of Surgery and the Department of Physiology, University of Toronto Faculty of Medicine.

¹ Murray, D. W. G., Jacques, L. B., Perrett, T. S., and Best, C. H. Heparin and Vascular Occlusion. *Canad. M. A. J.* 35: 621-622 (Dec.) 1936.

² Charles, A. F., and Scott, D. A. Studies on Heparin. IV. Observations on the Chemistry of Heparin. *Biochem. J.* 30: 1927-1933 (Oct.) 1936.

³ Schmitz, Adolf, and Fischer, Albert. Ueber die chemische Natur des Heparins. II. Die Reindarstellung des Heparins. *Ztschr. f. physiol. Chem.* 216: 264-273 (May 3) 1935.

⁴ Murray, D. W. G., Jacques, L. B., Perrett, T. S., and Best, C. H. Heparin and the Thrombosis of Veins Following Injury. *Surgery* 2: 163-187 (Aug.) 1937.

⁵ Jorpes, Erik. The Chemistry of Heparin. *Biochem. J.* 29: 1817-1830 (Aug.) 1935.

⁶ Hedenus, Per, and Wilander, Olof. The Influence of Intravenous Injections of Heparin on Man on the Time of Coagulation. *Acta med. Scandinav.* 88: 443-449, 1936.

⁷ Best, C. H., Cowan, Campbell, and MacLean, D. L. Heparin and the Formation of White Thrombi. *Science* 85: 338-339 (April 2) 1937.

⁸ In consultation with Dr. A. F. Charles of the Connaught Laboratories it has been decided to change the size of the unit of heparin. The crystalline barium salt is apparently remarkably uniform in potency. Therefore this has been adopted as a standard and a certain amount of material set aside for this purpose. These crystals are now considered to contain 100 units of anticoagulant activity per milligram. This unit is five times as large as that referred to in our previous paper.

patient's blood after the operation may in the present state of our knowledge be used as a guide in determining the initial rate of injection of heparin. The clotting time may be determined by one of the simple methods such as the breaking off of bits of a capillary tube which has been filled with blood.¹

When this dosage of heparin is used and the injection is begun from one to three hours after the operation is completed our experience indicates that there is little danger of bleeding from the cut surfaces if very thorough hemostasis is practiced. There is always the possibility, however, that this might happen in spite of the greatest care. The patient should obviously be most carefully watched with this point in mind. It should be emphasized that nothing but the purest heparin is to be used in the investigation of the effects on human subjects. All the heparin used in the clinic here has been prepared by Dr. Charles as a crystalline barium salt and the barium has subsequently been completely removed. When this material is administered, as outlined, no toxic effects are observed.

Through the generosity of a private citizen the cooperation of the Connaught Laboratories and the continued aid of the Banting Research Foundation arrangements have now been completed which will probably permit investigation of the effects of heparin for an extended period in the department of surgery. It is hoped that the results of this study, in conjunction with reports which may appear from other sources will permit a conclusion to be reached regarding the therapeutic possibilities of heparin.

Clinical Notes, Suggestions and New Instruments

EPIDURAL HEMANGIOMA WITH COMPRESSION OF SPINAL CORD

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My purpose in this paper is to present a case of epidural hemangioma with a fatal outcome from compression of the spinal cord. The presence of a hemangioma in the subcutaneous tissue of the same dermatome and a sudden onset of paralysis and sensory changes below this level should have suggested the correct diagnosis. There would have been an expectation of complete recovery if the epidural hemangioma had been removed soon after the onset of symptoms.

Cushing¹ in 1906 cited three cases of his own and three from the literature in which facial hemangiomas were associated with vascular tumors of the cerebral meninges. In this article Cushing suggested for the first time that organs other than the skin but in the same segment of nerve distribution could be similarly affected. Since the publication of his paper facial hemangiomas and associated intracranial vascular anomalies have been observed many times.

Cobb² in 1915 reported one case of his own in which cutaneous hemangioma was present and seven from the literature in all of which there were intradural spinal hemangiomas. In his own case there was an associated hemangioma in the skin of the same dorsal segment in which the intradural hemangioma was found at operation. This cutaneous hemangioma together with symptoms and signs of cord compression at this level led to a correct preoperative diagnosis of intraspinal hemangioma. Cobb arrived at the

following conclusions: "1. Skin naevi (hemangiomas) are at times of diagnostic value when segmental phenomena referable to the central nervous system are involved. 2. Congenital blood-vascular tumors apparently arise from a developmental fault of the central nervous system so that these lesions may occur in any of the organs innervated by filaments from that neuromere.

Although much can be found in the literature about skin hemangiomas of the face associated with intracranial vascular anomalies very little can be found about skin hemangiomas of the trunk associated with intraspinal vascular anomalies. The association of skin and epidural hemangiomas of the same embryologic segment is a feature of interest in the case reported here.

In 1929 Globus and Doshay³ reviewed the literature and were able to collect the following verified cases of intraspinal vascular anomalies with symptoms and signs of compression of the spinal cord:

1. Twenty-eight cases of dilatations of spinal veins (also called pial hemorrhoids and angioma venosum racemosum).

2. Six cases of arterial or arteriovenous aneurysms of the spinal vessels.

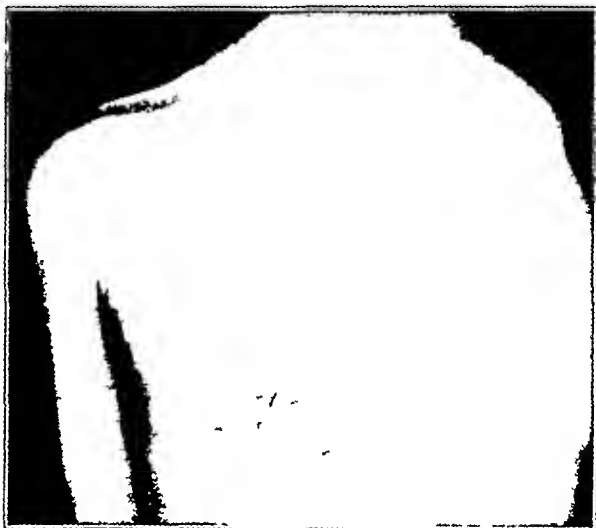


Fig. 1.—Back of patient showing hemangioma below left scapula at the level of the tenth rib.

3. Hemangiomas: (a) intramedullary hemangiomas, eight cases; (b) extramedullary pial hemangiomas, three cases; (c) epidural hemangiomas, ten cases; (d) vertebral hemangiomas, seven cases.

Since the publication of this report a review of the literature reveals only three additional cases of epidural hemangioma. These three cases⁴ together with the ten collected by Globus and Doshay make thirteen. The following case report raises the total to fourteen cases. This type of vascular anomaly is particularly worthy of attention because of its extradural location and easy accessibility. In seven of the total of fourteen cases laminectomy and removal of the tumor resulted in partial or complete recovery. In one case laminectomy resulted in death. In six cases laminectomy was not attempted. In none of the other thirteen cases was the onset so sudden and dramatic as the one described here.

REPORT OF CASE

History.—A boy aged 5 years while playing Feb. 16, 1931, complained of sudden abdominal pain. He continued to play for ten minutes and then came doubled over and screaming to

¹ The clinical work in Professor Gullies department has been conducted in collaboration with Dr. F. R. Wilkinson and Dr. Ros. MacKenzie. From the Department of Pathology, Vanderbilt University School of Medicine.

² Cushing, Harvey. Cases of Spontaneous Intracranial Hemorrhage Associated with Trigeminal Nervi. *J. A. M. A.* 47: 178 (July 21) 1916.

³ Cobb, Stanley. Hemangioma of the Spinal Cord. *Ann. Surg.* 62: 641 (Dec.) 1915.

⁴ Globus, J. H. and Doshay, J. J. Venous Dilatations and Other Intraspinal Vessel Alterations Including True Angiomas with Signs and Symptoms of Cord Compression. *Surg. Gynec. & Obst.* 18: 343 (March) 1929.

⁵ Mixer, W. J. in Lewis, Dean. Practice of Surgery. Hagerstown, Md. W. F. Prior Company. 12: 4 (Chapt. 3) 1932. Connell, W. F. and Hay, W. D. Cavernous Angioma of the Epidural Space with Compression of the Spinal Cord. *Canad. M. A. J.* 22: 75 (Jan.) 1930.

his mother. She was unable to hold him and he fell after two or three steps. He complained that his legs were asleep and were without control. Paralysis remained complete. Two or three hours later he began shaking, and there were twitchings of the shoulders and arms. The neck became rigid and the head drew back, apparently in typical opisthotonos. This

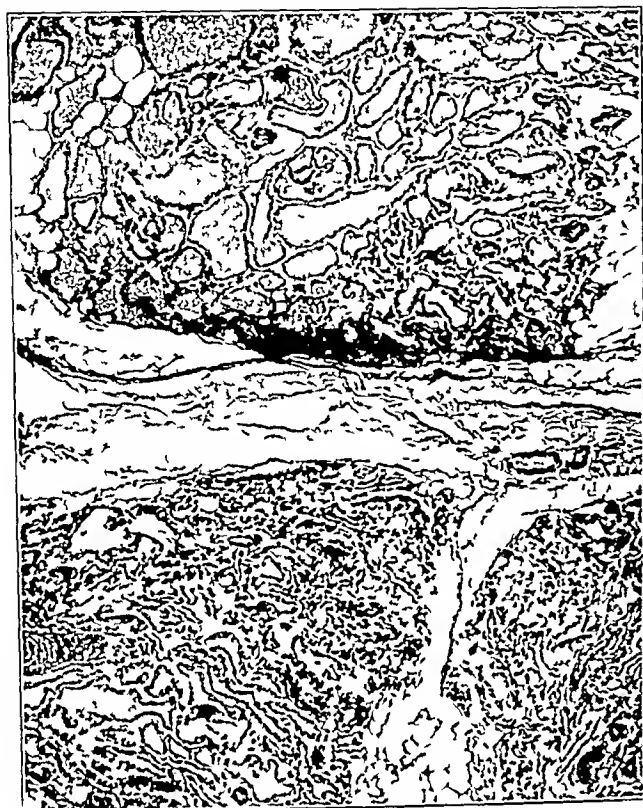


Fig. 2—Section through hemangioma in the skin of the back showing endothelial lined spaces filled with blood. $\times 75$

lasted for several minutes and he then relaxed, only to have a recurrence but with decreasing intensity. The legs were completely flaccid. The convulsions ceased and the child slept. Large doses of paregoric were given during the convulsions. He vomited once during the night. Since his legs were cold, a hot iron was placed at his feet. This burned the soles of his feet without causing pain.

February 17, twenty-six hours after onset, he was admitted to another hospital. The temperature was 102 F, the pulse 120. The abdomen was distended and slightly rigid, and there was a flaccid paralysis of the lower extremities. The neck was still rigid. Spinal puncture revealed a pressure of 170 mm of water, a cell count of 80, all lymphocytes, no increase in the globulin and 30 mg of sugar per hundred cubic centimeters.

Hemoglobin was 80 per cent, white blood cells numbered 12,800. Examination of the urine showed specific gravity of from 1.004 to 1.028 and no albumin or sugar. Sediment showed mucus with a few white blood cells.

No urine had been passed in the twenty-six hours previous to admission. He was catheterized repeatedly; there had been no improvement when he was discharged March 1. The hemangioma on the back was not mentioned. There was no record of a sensory examination. A diagnosis of poliomyelitis was made.

First Admission.—The child was cared for at home, being catheterized from one to three times a day. Although quite sick at times, he was not seen in a hospital again until Nov. 26, 1934, when he was admitted to the Vanderbilt Hospital for the first time at the age of 8 years. About sixty hours before admission he had chills and epigastric pain associated with vomiting. He did not appear very ill. The respirations were normal and the chest was clear. The abdomen was relaxed and pressure on a small mass in the pelvis caused dribbling

of urine. There was evidence of irritation about the penis, scrotum and perineum from constant dribbling. The rectal sphincter was relaxed. The testes were not felt in the scrotum or inguinal ring. There was atrophy of all muscle groups in the legs.

The cranial nerves were normal. Reflexes were hyperactive with abnormal toe signs and a marked mass reflex to painful stimuli which the patient did not feel. There was spastic paralysis of both lower limbs with anesthesia below the eighth and ninth dorsal vertebrae and questionable hyperesthesia at this level. Movement and sensation above this cord level were normal. There was prominence of the first lumbar spine. On the left side of the back there was a well circumscribed, raised, vascular mass measuring about 3 by 5 cm. There was no thrill or bruit. X-ray examination showed a little scoliosis in the lumbosacral region, but no pathologic change was noted in the bodies of the vertebrae or intervertebral disks.

Examination of the urine showed albumin 2 plus, sugar negative, 25 white blood cells per high power field with some clumping, no red cells, and only an occasional granular cast (noncentrifuged).

Red blood cells numbered 3,880,000, with 11 Gm of hemoglobin, white blood cells 32,200, with 75 per cent of polymorphonuclear leukocytes. The Wassermann and Kahn reactions were negative. Nonprotein nitrogen was 67, fasting blood sugar 56, carbon dioxide combining power 32.4 volume per cent.

On lumbar puncture the initial pressure was 20 mm of water, which rose to 250 mm with compression of the jugular and rapidly returned to 20 mm when the pressure was released. The fluid was clear. There were 6 lymphocytes and 7 polymorphonuclears per cubic millimeter. Test with Pandey's reagent showed no globulin with two drops of fluid per cubic centimeter of Pandey's reagent.



Fig. 3—At left posterior surface of dura showing the extradural hemangioma and fibrous tissue which extended from A to B (eighth to twelfth dorsal segments). Note the normal dura above and below these levels. At right anterior surface of cord with dura opened to show the localized area of atrophy (ninth to eleventh dorsal segments) opposite the extradural hemangioma.

In view of the results it was felt that the child had a transverse myelitis at about the level of the eighth to the twelfth dorsal cord segment with spastic paraplegia and that there was irreparable cord damage, and no exploration or resection of the cord was done. He was discharged somewhat improved Jan. 1, 1935. The child had an infection of the urinary tract at

some retention due to paralysis of the bladder. A suprapubic cystostomy was done and the nonprotein nitrogen fell slightly, but he continued to have a 'picket fence' temperature with a summit of 103 F. He was followed in the outpatient department for the next thirteen months during which the course was uneventful.

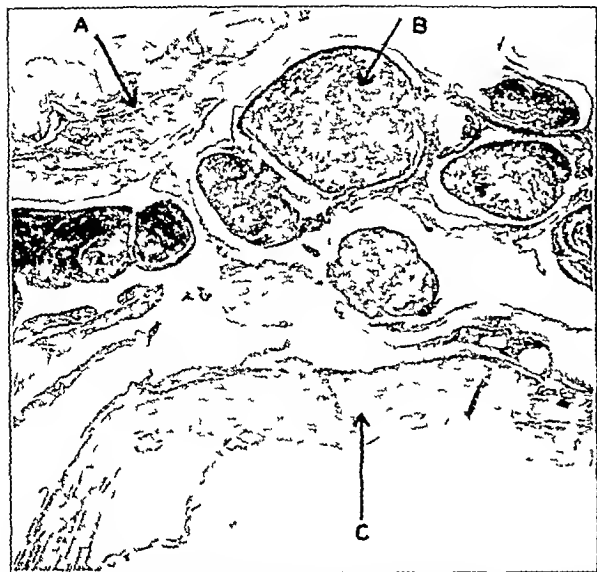


Fig. 4—Section through extradural hemangioma showing old fibrosis (A), endothelial lined spaces filled with blood (B) and the dura (C) $\times 14$

Second Admission—Four weeks before his second admission he contracted a severe cold and had a high fever, chills and a cough, which was productive of a moderate amount of purulent sputum without blood. One week before admission he complained of abdominal pain and became nauseated, vomiting everything he took, even water and most fruit juices. He passed very little urine, which was quite thick. He was drowsy the week before admission and was noted to have jerking movements of the legs but no headache or visual disturbances. For the second time he was admitted to the pediatric service of the Vanderbilt Hospital Feb. 20, 1936.

The temperature was 99.8 F, pulse 140, respiratory rate 26. There was marked malnutrition with atrophy and spasticity of the lower extremities. The cystostomy tube was draining thick yellowish white urine. The patient was drowsy. The blood pressure was 136 systolic, 114 diastolic. The heart and lungs were normal.

Examination of the urine showed three plus albumin and innumerable white blood cells with marked clumping. There were also many red blood cells and a few granular casts. Nonprotein nitrogen was 124 on admission and 169 at death.

He was placed on a high caloric and high vitamin diet and fluids were forced. He was given dextrose intravenously and received one transfusion but continued to vomit, became more drowsy and died February 26 apparently of uremia.

ALTOUS PROTOCOL

A complete gross and microscopic examination was done but only the pertinent facts are included in the present report.

There was a hemangioma of the skin measuring 8 cm in diameter situated just below the left scapula over the tenth rib. Pyelonephritis was present.

On the posterior surface of the dura at the level of the eighth to the twelfth thoracic vertebrae there were fresh blood clots and in this area was some tough grayish fibrous tissue. There were clots in dilated blood spaces. The leptomeninges were smooth and there was no evidence of inflammation or hemorrhage within the dura. At the ninth to eleventh thoracic segments there was a distinct localized area of atrophy with grossly normal cord above and below

this region. Directly behind this atrophic area was the extradural hemangioma and fibrosis which undoubtedly caused compression of the cord.

At the level of the old atrophy of the spinal cord (tenth thoracic) there was almost complete demyelination and disappearance of ganglion cells with increased irregular glial fibrosis. At this point the cord was greatly distorted and it was impossible to evaluate the tracts destroyed.

Briefly the ascending tracts were involved above and the descending tracts below the lesion.

Sections through the dura at the tenth thoracic level showed extradural antemortem blood clots lying in dilated spaces lined with endothelium having the appearance of a true hemangioma. Some of these spaces had only an endothelial lining with a few supporting strands of fibrous tissue while others had considerable fibrous tissue in the wall.

There was considerable extradural fibrosis as seen in the gross. This fibrous tissue was hyalinized and had a few phagocytic cells containing golden brown hemosiderin pigment.

COMMENT

The presence of a hemangioma in the dermatome below which there is sudden paralysis and sensory change should point to a diagnosis of intraspinal vascular anomaly, and such a diagnosis should have been made in the case reported here. Unfortunately this condition was not considered until three years later when the patient was seen for the first time in the Vanderbilt University Hospital. At this time there was an extensive cystitis and pyelonephritis with renal insufficiency resulting from repeated catheterization of the cord bladder. A suprapubic cystostomy was done to allow free drainage of urine. The neurologists felt that the cord and kidney damage were irreparable and operation would only hasten the fatal outcome.

The sequence of events in this case can be explained readily by the pathologic changes. It seems likely that one of the thin-walled blood spaces of the epidural hemangioma of the tenth dorsal segment (fig. 3 left and fig. 4) ruptured, causing sudden compression of the cord. Sudden paralysis and sensory changes below this segment, epigastric pain and opisthotonos followed. Because the lesion was extradural no red cells were

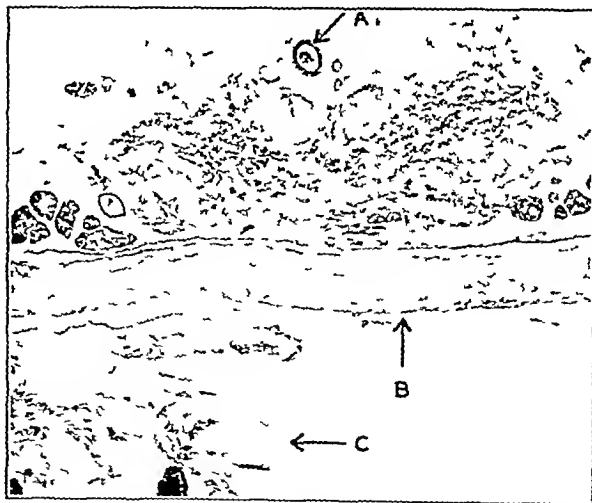


Fig. 5—Section of cord and dura at tenth dorsal segment. Note the marked atrophy of the cord which lies between the ventral spinal artery (A) and dura (B). Some of the extradural fibrosis which was not peeled off remains at (C) $\times 14$

present in the spinal fluid. There was never any evidence that the compression of the cord was relieved, which would suggest an organization of the resulting extradural clot. The amount of extradural fibrosis is consistent with this hypothesis. The end stage of localized cord atrophy is best illustrated by photographs (figs. 3 right and fig. 5). Compression of the cord caused the so-called cord bladder. Repeated catheteri-

zation led to cystitis and pyelonephritis. Renal insufficiency with uremia was the cause of death.

SUMMARY AND CONCLUSIONS

1 Globus and Doshay in 1929 collected from the literature ten reports of cases of verified epidural hemangiomas in which signs of cord compression were present. Four other cases including the case reported here make a total of fourteen such cases.

2 The case reported here is of particular interest because of the associated hemangioma in the same dermatome.

3 Cutaneous hemangiomas are of great diagnostic value when segmental phenomena referable to the central nervous system are involved.

Special Clinical Article

INJURIES OF THE KNEE JOINT

CLINICAL LECTURE AT ATLANTIC CITY SESSION

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Derangements of the knee joint the result of trauma are comparatively common. This situation has been appreciated for a number of years in the British Isles but has not found wide recognition in this country; indeed, there is still a widespread lack of information here on such injuries. The almost universal indulgence through the British Empire in rugged football, which throws a heavy strain on the knee with frequent injuries to this joint is responsible for the development of the understanding which the members of the medical profession of Great Britain have of derangements of the knee. Lately with the opening up of the American game of football the speeding up of baseball automobile accidents and the great increase in industrial injuries, all leaving in their wake injuries to the knee joint interest in the pathology of that joint is being quickened in this country.

Before the discussion of derangements of the knee joint is taken up, the anatomy of this important and complicated articulation might advantageously be reviewed. The knee joint consists essentially of the broadened ends of the tibia and the femur with a sesamoid bone, the patella, in the extensor apparatus, two fibrocartilages interposed between the ends of the tibia and the femur, two cruciate ligaments, anterior and posterior, and two lateral ligaments the internal and the external. In addition to these structures comprising the knee proper nature has provided it with strong muscles which play an important role in its control and protection. Such a complicated anatomic arrangement is necessary for the knee must be strong since it must sustain the body weight transmitted to it through long levers and at the same time must permit the wide range of movement necessary for locomotion and activity.

The great strength of the knee joint, however, is dependent on the integrity of the two cruciate and the two lateral ligaments and the muscles which surround it. So important are the ligaments that a brief description of them is worth while (fig. 1).

The cruciate ligaments, anterior and posterior, help in preventing lateral movement of the knee particularly when it is flexed. Their chief function however, is to

prevent the tibia from slipping backward and forward on the femur and to limit rotation of the tibia on the femur.

The internal lateral ligament, a long fan shaped structure is of great importance, since it sustains most of the burden of preventing lateral movement of the knee. It has further importance in that the internal semilunar cartilage is firmly attached to it at least in its posterior part so that stresses and strains to which it is subjected are transmitted to that cartilage.

The external lateral ligament is a long cordlike bundle which, with the biceps tendon strengthens the outer side of the joint. It is entirely separate from the capsule of the joint, and the external semilunar cartilage is not attached to it.

Any of the structures entering into the formation of the knee joint may, under proper condition of stress be injured and the function of the joint interfered with. It is obviously impossible to attempt to discuss all the various injuries to the knee joint which may occur, and this paper will deal only with the three most common derangements which occur as the result of injury. They are (1) injury to the semilunar cartilages (2) injury to the internal lateral ligaments and (3) injury to the cruciate ligaments.

INJURIES TO THE SEMILUNAR CARTILAGES

The internal and the external semilunar cartilage are crescentic fibrocartilages interposed between the tibia and the femur (fig. 2). They are thick at their outer border and thin at the inner margin. Each cartilage assists the opposite lateral ligament in resisting lateral movement of the knee for it acts as a wedge between the tibia and the femur and helps to keep the cruciate ligaments tense. The outer thick margin of the internal semilunar cartilage is firmly attached to the capsule and to the internal lateral ligament. The inner margin is free. The anterior cornu of the internal cartilage is always attenuated, and its attachment to the tibia is never very strong. The external cartilage is less firmly attached to the capsule and has no attachment to the external lateral ligament. In addition both cartilages are attached to the tibia by coronary ligaments (fig. 3) the fibers of which are weak and lax and permit some movement of the cartilages on the tibia. The fibers of the coronary ligament of the external semilunar cartilages are longer than those of the internal cartilage and permit wider range of motion between the external cartilage and the tibia than is possible with the internal. It is evident then that the external semilunar cartilage is much less firmly attached than the internal and has therefore a much wider range of movement. This fact has importance with reference to injuries of the cartilages as will be seen later. Both cartilages move with the femur on the tibia in rotary or twisting movement of the knee.

Incidence.—In 214 of a series of 241 cases of derangement of the knee joint in the clinic with which I am associated the diagnosis was injury to the semilunar cartilages. In 169 the injury involved the internal semilunar cartilage and in forty-five the external. Injuries to the internal semilunar cartilage then are three and seven-tenths times as frequent as those of the external cartilage. This ratio is lower than that reported by most observers, except Naughton Dunn¹ of Birmingham, England, who found that in 255 cases the ratio of injury to the internal semilunar

Read in the Surgical Division of the General Scientific Meetings at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 8, 1934.

¹ Dunn, Naughton. *Lancet* 1:1267 (June 16) 1934.

cartilage to that of the external cartilage was 26 to 1. The reason for the marked predominance of injuries of the internal semilunar cartilage over those of the external is anatomic. First, the greater mobility of the external cartilage allows it to move about and to avoid injury. Second, the range of inward rotation of the femur on the tibia which is a direct strain on the internal semilunar cartilage, is greater than that of external rotation, which is a strain on the external semilunar cartilage.

Etiology—While there are predisposing causes of derangements of the semilunar cartilages such as joint disease, lax ligaments and static defects due to flatfoot and knock knee, the immediate etiologic factor is trauma. By far the greatest number of injuries to cartilage are due to indirect trauma, the most common type of which is inward twisting or wrenching of the knee when it is in a slightly flexed position and the foot is fixed (fig. 4) or outward rotation of the knee under the same conditions. With inward rotation of the knee the internal lateral ligament is stretched and allows separation of the joint surfaces and slipping inward of the internal semilunar cartilage. As the separated bones snap back the cartilage is nipped and damaged. If the rotating force continues, the cartilage moving with the femur on the tibia is torn loose or ground between the upper and the nether millstones and fractured.

It is commonly believed that the damage generally suffered is a tearing loose of the cartilage from its attachment to the capsule, with displacement. While this is true of injuries to the external semilunar cartilage, it has been the experience at our clinic, which coincides with that of Platt of Birmingham, England, and W. Rowley Bristow of London, England, that so far as the internal cartilage is concerned a displacement is not frequent but instead the cartilage, in the majority of instances is fractured. Of sixty-eight internal semilunar cartilages operated on, fifty-four were fractured and only fourteen were hypermobile. The explanation of the difference in the type of injury suffered by the internal and the external cartilages probably lies in the manner of attachment of the cartilages. The external cartilage being much more movable than the internal, can accommodate itself more readily to stress and strain and thus avoid serious injury. The fact that injuries to the internal cartilage are almost always fractures has a decided bearing on treatment.

Symptomatology—In the case of an acute injury to the knee the history of a torsion or twisting strain on the knee joint is an important lead and should always suggest a careful investigation for injury to cartilage. The degree of trauma need not be severe, in fact, a comparatively slight twist under the proper conditions may result in damage. The knee immediately becomes distended with synovial fluid and some blood is extremely painful on manipulation particularly a twist, and cannot be completely extended, it complete extension is forced extreme pain is complained of. There is usually tenderness on the inner side of the knee just to the inner side of the patella over the attachment of the internal cartilage or over the anterior attachment of the external cartilage to the outer side of the patella. Of these symptoms failure of complete extension of the knee is most important in the opinion of my co-workers and me.

When a derangement of the knee is seen days or weeks after the injury, the picture may be quite different. There may be no effusion in the knee and local tenderness over the cartilage attachment may be slight or absent. So long, however as the cartilage or a fractured part of it is displaced, limitation of complete extension will persist. On examination it will be found that the knee both at rest and in weight bearing is held in from 10 to 15 degrees of flexion and attempts to secure complete extension are resisted and cause pain over the cartilages external or internal and in the popliteal space. If the thigh is acutely flexed on the trunk, the knee is flexed to a right angle on the thigh and torsion movements of the knee are made pain over the internal semilunar cartilage can be elicited with internal rotation if the internal cartilage is displaced or fractured and pain over the external

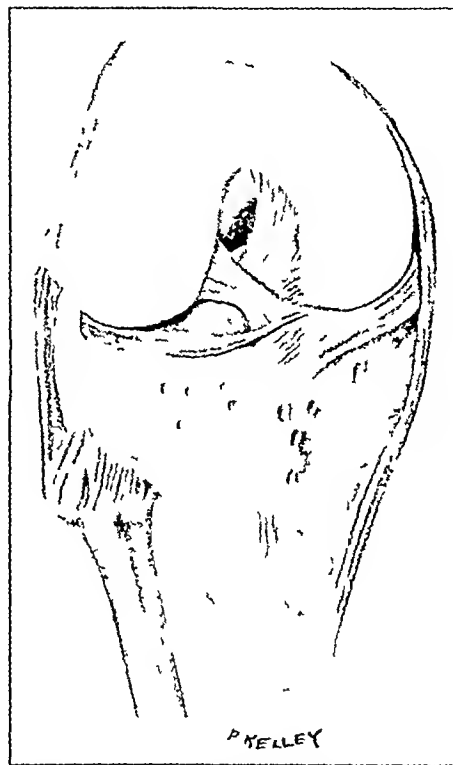


Fig. 1—Anterior and posterior cruciate ligaments, internal lateral ligament attached to the internal semilunar cartilage and external lateral ligament.

semilunar cartilage on external rotation if that cartilage is involved. One sign of injury to cartilage which is frequently spoken of is "locking." By "locking" is meant a sudden fixing of the knee in a partly flexed position so that it cannot be extended until it is manipulated. "Locking" in this sense is according to our experience a comparatively rare occurrence.

"Locking" in the sense that complete extension of the knee is impossible occurs in practically every case of injury to the internal cartilage but is somewhat less constant with injuries to the external cartilage. The condition, however, should be spoken of as "blocking" rather than "locking." In cases of subacute and chronic derangement, the patient in addition to the objective symptoms complains of pain in the knee on use giving way and more or less insecurity—all due to the fact that the knee is being used in a more or less flexed

position, with resulting strain, irritation and instability. The x-ray evidence of injury to cartilage will be negative.

Diagnosis—In most cases the diagnosis of injury to cartilage is not difficult, though frequently it is impossible to make a definite statement as to the extent and location of the damage. The history of an injury with acute onset of symptoms, the characteristic point of tenderness, loss of complete extension, and pain and insecurity in the knee are the most reliable diagnostic

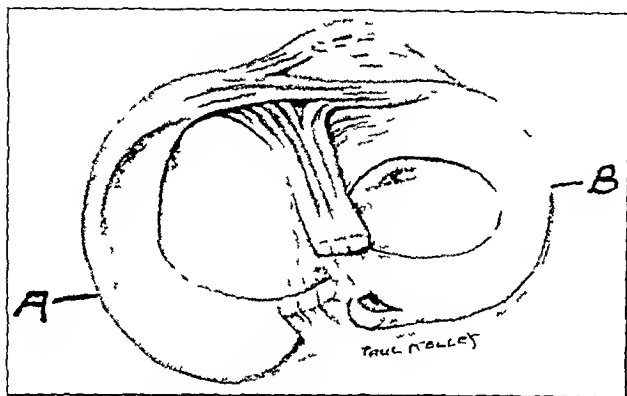


Fig 2—A internal semilunar cartilage B external semilunar cartilage

signs. The derangements of the knee which must be ruled out in diagnosing injuries to cartilage are the presence of loose bodies, tears of the cruciate ligaments and ruptures or strains of the internal lateral ligament. The presence of loose bodies may be eliminated by x-ray examination and the transitory character of the symptoms. Tears of the cruciate ligament are usually the result of severe injury and are accompanied by marked instability of the knee, particularly in the anterior posterior direction. Injuries to the internal lateral ligament give pain on the inner side of the knee, but there is no blocking of the extension, and the tenderness complained of is usually at the insertion of the ligament into the internal condyle of the femur and not over the cartilage.

Treatment—Before I discuss the specific treatment of injuries to cartilage, I should make one statement as being applicable to all derangements of the knee joint. After any injury to the knee which produces effusion and definite symptoms of derangement, the knee should immediately be immobilized in extension by a plaster cast and should remain immobilized until the acute symptoms subside. Such a cast may be removed in a week or ten days, that is, when acute symptoms have disappeared, for more complete examination and the determination of the specific treatment indicated. With such a course, the knee joint is placed in the most favorable position for healing, whatever the form of injury may be, and the complete immobilization thus secured will insure the most rapid subsidence of acute symptoms and so enable an accurate estimate of the disturbance present to be made at the earliest possible moment.

The nature of the treatment of injuries to cartilage depends on whether the attack is the initial attack or a recurrence of a former one. Treatment should be conservative for an initial injury and in the acute stage of any attack and radical if disability persists after conservative treatment has been given a fair trial or if the patient has given a history of repeated derangements.

Conservative Treatment—The keynote of conservative treatment of injuries to cartilage is reduction of the displacement of the cartilage or of the displaced fragment if the cartilage is fractured. To accomplish these measures when the internal semilunar cartilage is involved, the thigh should be flexed on the trunk acutely and the knee acutely on the thigh. The leg should then be abducted and rotated outward to increase the space between the internal condyle and the upper surface of the tibia. The leg should then be brought sharply into extension with as complete relaxation of the knee as can be obtained (fig 5). At time an anesthetic may be used with advantage to secure the desired relaxation. Occasionally several attempts may be necessary to secure reduction, proof of which is that the knee may be completely extended without discomfort or pain. With injury to the external cartilage the same maneuver with internal rotation instead of external rotation should be carried out.

After reduction has been secured a cast should be applied, extending from the upper part of the thigh to just above the ankle, and crutches should be used for locomotion. The cast should remain on a minimum of three weeks. At the end of this time it may be bivalved and massage and guarded exercise used to restore muscle tone and to build up muscle control of the joint. At the end of four weeks the knee may be used with a bandage support, which support should be worn for about another week. A fairly satisfactory number of displacements are completely cured with this form of treatment. Among seventy-three patients

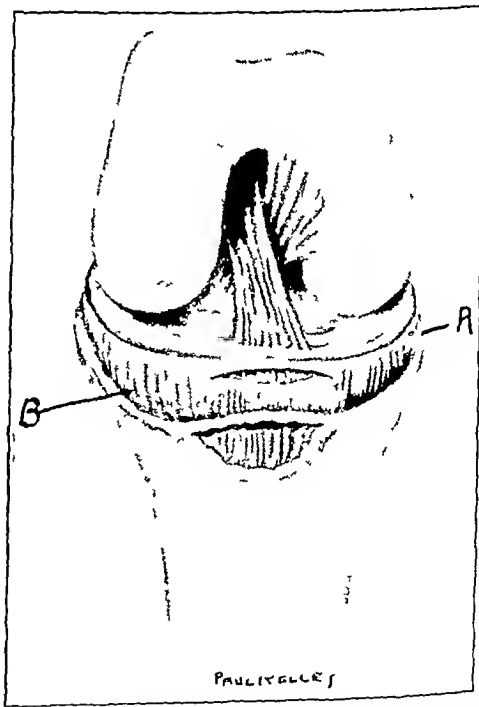


Fig 3—A internal coronary ligament B external coronary ligament with its longer and more lax fibers

treated conservatively for an injured cartilage, fifty nine recovered, nine did not recover, and in five cases the outcome is unknown.

If, however, after well planned conservative measures have been carried out, complete extension of the knee cannot be secured and disability persists operative

treatment is indicated and is usually necessary for recovery. Also, if after recovery with conservative treatment other attacks occur, further attempts at conservative treatment will probably be unsuccessful and removal of the cartilage is indicated. With recurrent derangements the injury is almost certainly a fracture of the cartilage, and interference with the function of the knee joint cannot be overcome by any form of conservative management. Since experience has shown that most injuries to the internal semilunar cartilage are fractures, it follows that many will require removal.

Operative Treatment—The operation for removal of a semilunar cartilage must be carried out with rigid aseptic technique and with the use of a tourniquet. Various types of approach have been recommended, but our distinct preference is for that described by Sir Robert Jones¹ (fig 6) which may be briefly described as follows. With the knee flexed to 90 degrees over the end of the table, an incision is made, starting at the lower internal angle of the patella, for the exposure of the internal semilunar cartilage, and extending downward and outward for about 3 inches. Care must be exercised so that the incision is not carried too far downward or outward, or the patellar branch of the internal saphenous nerve will be cut and pain down the leg or a painful neuroma may result. This incision

Fig 4—Inward twisting of the knee in a flexed position; this is the form of trauma which is responsible for most of the injuries to the internal semilunar cartilage.

is deepened and the joint is entered. The cartilage is readily discernible and should be examined carefully for mobility and for fracture. As stated, hypermobility of the internal cartilage in patients who come to operation is not frequent, and the usual lesion is a fracture.

This fracture may involve the anterior half (30.8 per cent in our series) or the posterior portion (19.7 per cent in our series); it may be a longitudinal split (12.3 per cent in our series) or the so called bucket handle type, in which the split-off section turns up and lies in the joint (16 per cent in our series). In 2.6 per cent the type of fracture was not recorded, and in 20 per cent the cartilage was hypermobile. It is our custom to remove the entire cartilage if possible, or at least all except the most posterior part. If complete removal is not carried out, fracture of the posterior part of the cartilage may be overlooked and symptoms reappear later. Naughton Dunn found in two large series of cases that from 49 to 50 per cent of the fractures occurred in the posterior part of the cartilage. It should be stated however, that many competent operators feel that the removal of the detached portion of the cartilage is sufficient.

Removal of the cartilage should start at its anterior attachment; the operator first cutting the coronary

ligaments, and the cartilage should be separated from before backward, while it is kept under considerable tension. One must exercise care not to injure the internal lateral ligament to which the cartilage is attached. After removal of the cartilage, the joint should again be carefully inspected and the external cartilage viewed as far as possible. A good view of the anterior part of the external cartilage can be obtained by careful retraction. The wound should be carefully sutured in layers when the closure is being made. No rigid fixation is used in our clinic after operation. A pressure bandage composed of voluminous cotton dressings, tightly compressed by a broad muslin bandage so applied that the cotton projects above and below the circular turns is all that is used. This bandage controls hemorrhage and sufficiently immobilizes the knee. Mild movements are started in four or five days, and as soon as the stitches are removed on the tenth day active flexion and extension are encouraged and weight bearing permitted with the knee held in extension. Full use is permitted in three weeks, and normal activity may be resumed in four or five weeks.

The incision for removal of the external semilunar cartilage is exactly the same as that made for the removal of the internal cartilage except that it is placed on the outer side of the joint. At times both cartilages are involved, and both must be removed. This situation occurred in five of our cases. We prefer two separate incisions in such cases, as the cartilages can be removed with less trauma and more satisfactorily than with one large incision. The use of large

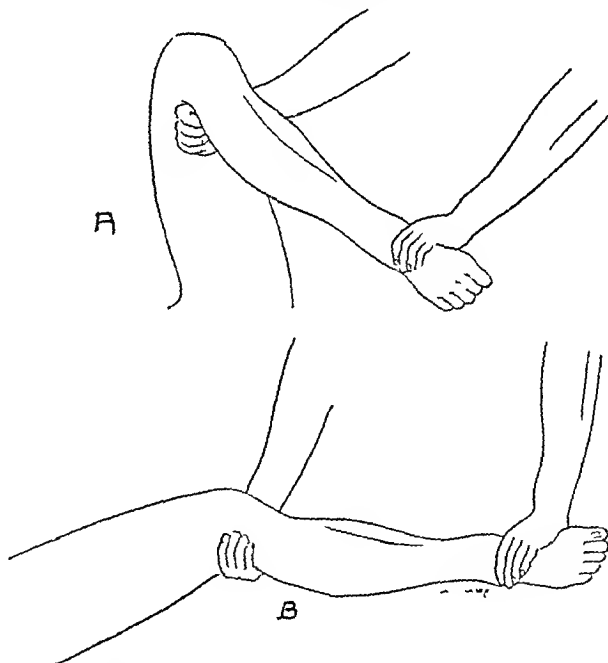


Fig 5—Manipulation to reduce displaced internal semilunar cartilage. A acute flexion and external rotation. B extension and external rotation.

incisions, such as the split patella and parapatellar approaches, is unnecessary and, in our opinion and in the opinion of many others, has distinct disadvantages in that more damage is done, the period of convalescence is prolonged and at times unnecessary residual disability results. If, on inspecting the cartilage in a knee which has been opened, one finds no fracture, but

¹ Jones, Robert. Notes on Derangements of the Knee. Ann Surg 50: 969-1001 (Dec) 1909.

the cartilage is in any degree hypermobile, it should be removed, even if the degree of hypermobility does not seem sufficiently great to cause many symptoms, provided of course definite symptoms of derangement of the cartilage were present at examination before operation

The results of removal of cartilage when properly carried out have been excellent according to our experience and that of a host of others. In seventy-six, or 86.3 per cent, of our series of eighty-eight cases in which one or both cartilages were removed, the results were good, in eleven, or 12.5 per cent, they might be termed incomplete and in one, or 1.2 per cent, they were unsatisfactory. By a good result is meant one which gives return of function in the knee and relief from disability, permits the resumption of the former

occupation and allows the patient normal activity. By an incomplete result is meant one which relieves the symptoms but does not permit extensive activity to be entirely resumed. It should be remembered that when a displacement of cartilage has persisted over a period of months or years, secondary changes in the knee joint will occur, such as injury to the articular cartilages, arthritic changes, relaxation of the ligaments and loss of muscle control, and that even after the removal of the offending cartilage under such conditions, some interference with function and some disability may persist although the symptoms attrib-

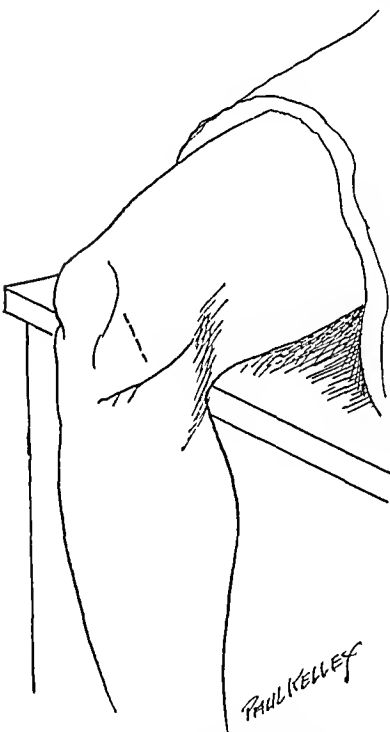


Fig. 6.—Jones's oblique incision with the knee flexed for removal of internal semilunar cartilage. The patellar branch of the internal saphenous nerve is seen below the incision.

utable to the derangement of cartilage may be entirely eliminated. Most of the incomplete results were of this class.

INJURIES TO THE INTERNAL LATERAL LIGAMENT

Injuries to the internal lateral ligament are much more frequent than those to the external lateral ligament—about five to one. They are much less common than are injuries to cartilage. In 241 cases of injury to the knee joint, the internal lateral ligament was involved thirteen times.

Etiology.—As in the case of injuries to cartilage there may be factors predisposing to lesions of the internal lateral ligament, such as faulty statics, due to flatfoot, knock knee and arthritis. However, acute strain of the internal lateral ligament is, as a rule, traumatic in origin, and the form of trauma responsible is usually indirect. The most common form of indirect trauma which causes injury to the internal lateral ligament is inward bending or inward rotation—the same

type of injury which causes damage to the internal semilunar cartilage.

Symptoms.—At the time of the injury there are often a feeling as if something had torn loose on the inner side of the knee, acute pain referred to the inner side of the joint, often definite effusion into the knee and pain on attempts at complete extension, owing to the fact that in extension of the internal lateral ligament the ligament is made tense. "Blocking" of extension is not present. The flexed position which the knee assumes is due to the greater comfort it affords, and gentle forcing will bring the knee into full extension; this is impossible with "blocking" due to a displaced cartilage. The greatest point of tenderness is on the inner side of the knee, not over the attachment of the internal semilunar cartilage but farther back and usually higher up over the femoral attachment of the ligament. Less often, the point of tenderness may be over the attachment of the ligament into the tibia.

Treatment.—Treatment of tears of the internal lateral ligament in our clinic consists of complete immobilization of the joint in a cast, extending from the upper part of the thigh to just above the ankle, for four or five weeks. At the end of this time, massage and gradually increased active movements should be used to restore function. The joint should be protected between treatments for another week. At the end of five or six weeks protection should be discarded and resumption of normal activity should be encouraged but strain on the ligament should be prevented by elevating the inner side of the shoe, heel and sole three-sixteenths inch. The reason for rigid immobilization lies in the fact that after strain or tearing of the internal lateral ligament, traumatic exostosis or ossification of the ligament at the site of rupture or tear, usually at the femoral attachment, may occur, and we feel that complete immobilization until repair has taken place is the safest way to prevent or minimize such ossification.

Occasionally a rupture of the internal lateral ligament may result in so much laxity of the joint as to interfere with stability and cause definite disability. Under such conditions, operative procedures designed to reinforce the ligament by the use of fascial strips or to tighten the ligament by moving its attachment to the tibia downward, as described by Mauck,⁴ are justified and give satisfactory results. Our own preference at the present time, however, is for reinforcement by fascial strips as being a less extensive procedure and satisfactory as a rule. At times painful ossification of the internal lateral ligament may require surgical intervention, but only if it continues to give painful symptoms. Ample time should be allowed for spontaneous recovery of the patient before one proceeds to operation.

RUPTURE OF CRUCIATE LIGAMENTS

Ruptures of the cruciate ligaments occur less frequently than injuries to the internal semilunar cartilage and about as frequently as injuries to the internal lateral ligament. In 241 cases of injury to the knee joint, rupture of the anterior cruciate ligament occurred twelve times and of both ligaments but once. The injury is frequently accompanied by evulsion of the tibial spine or its internal tubercle. This complication occurred with rupture of the anterior cruciate ligament four times in our series.

Etiology—The cause of rupture of the cruciate ligaments with or without fracture of the tibial spine is violence, and usually severe violence. To cause rupture of both cruciate ligaments, extreme violence is necessary—such violence as would produce complete dislocation of the knee. Tears or relaxation of the anterior cruciate ligament also occur with a certain percentage of injuries to cartilage. This fact should not be lost sight of, and when a knee is opened for removal of cartilage a careful inspection of the cruciate ligaments should always be made before it is closed. Failure to recognize a tear or relaxation of the anterior cruciate ligament is often responsible for an incomplete result following removal of cartilage.

Symptoms—The history of a severe lateral bending or twisting of the knee is always suggestive, and if at the same time abnormal mobility is present, suspicion should be still further aroused. The anterior cruciate ligament is tense when the knee is fully extended and prevents the tibia from being displaced forward on the femur. It follows then that if in the extended position the tibia can be displaced forward on the femur there is a rupture or stretching of the anterior cruciate ligament. The posterior cruciate ligament is tense in complete flexion and prevents the tibia from being displaced backward on the femur. It follows then that if in complete flexion the tibia can be displaced backward on the femur there is rupture or stretching of the posterior cruciate ligament.

Our own preference, however for determining relaxation or rupture of the cruciate ligaments is to have the patient sit on a table with the knee flexed to about a right angle and the heel lightly braced against the seat of the examiner's chair. If the leg is firmly grasped with one hand just below the bend of the knee and the lower end of the femur steadied with the other hand, abnormal forward or backward movement of the knee can be readily determined by firmly pushing and pulling the leg backward and forward. When the knee is in this position, which is midway between complete flexion and complete extension, both ligaments should be moderately tense and permit no backward or forward movement in the knee joint. If such movement is present, a rupture or relaxation of one or both ligaments is present. Further tests with the knee in the extended or flexed position will then make possible a differential diagnosis between involvement of the anterior and of the posterior ligament. If a definite diagnosis is impossible, the final diagnosis should be left for determination at operation.

The most constant sign of fracture of the spine of the tibia or its internal tubercle is obstruction to full extension. The "block" feels like a definite bony obstruction and is quite different from the rubbery "blocking" which occurs when a semilunar cartilage is injured. X-ray examination will demonstrate the fracture of the spine or its internal tubercle.

Treatment—The management of a ruptured anterior cruciate ligament or evulsion of the tibial spine may be separated into that of the acute case and that of the chronic case with instability of the knee and persistent disability. The former should be conservative, the latter operative.

Conservative treatment consists of absolute immobilization of the knee in complete extension for two or three months. The repair of a ligament requires from five to seven weeks, and no strain should be placed on the knee during the period of repair. Plenty of

extra time should be allowed for complete healing. Only temporary stiffness follows even prolonged immobilization, and such stiffness need not be feared. Excellent results are obtained by such conservative treatment adequately carried out.

Ruptured cruciate ligaments which have failed to heal with conservative measures and neglected conditions require operative intervention if stability is to be improved and disability eliminated or reduced. Sufficient of the original cruciate ligament may remain to permit of its being sutured at operation. When this situation is found, we prefer the use of fascia lata for the suturing material. With fascia lata a firm attachment can be made to the bone and a real repair of the ligament made. When, as often happens, there is but a trace of the ligament left, reconstruction of a new anterior cruciate ligament must be carried out. Hey-Groves of England was the modern pioneer in such work, and most of the operations now used are modifications of his method. In principle the method consists of boring a tunnel through the external condyle of the femur and another tunnel through the inner tuberosity of the tibia and of passing through these tunnels a strong piece of fascia lata or a piece of tendon and suturing it there in such a manner as to reproduce the original ligament.

The results of the various operations for the reconstruction of the anterior cruciate ligament are in the main satisfactory. Complete stability of the knee is not always secured, but, if the operation has been properly performed, satisfactory improvement will nearly always result and complete relief of symptoms with a wide range of activity may be expected in a fair percentage of cases.

Rupture of the tibial spine or its internal tubercle will often become repaired with fixation of the knee in extension. If, however, healing does not take place, removal is indicated. The incision used is the parapatellar approach.

In conclusion I should like to emphasize the fact that internal derangements of the knee involving the semilunar cartilages or the lateral or the cruciate ligament constitute gravely disabling injuries. An accurate diagnosis made early will frequently make possible recovery by conservative measures, while, on the other hand, delay in instituting adequate treatment usually means a prolonged period of disability and frequently a permanent partial disability and makes necessary operative intervention. Finally, it should be generally recognized that, when conservative measures fail to give relief from an acute derangement of the knee or recurring derangements, operation is definitely indicated. If not too long delayed, operation offers a satisfactory outcome with practically no risk to joint or life, provided it is performed with a proper aseptic technique and by one familiar with the condition to be corrected.

1600 Professional Building

Qualities Beyond Rating—The qualities that really count in this world are quite beyond pigeonholing quite beyond measurement by scales, tape or mental tests, quite beyond rating by any known system of examination, all of which fail in giving us an estimate of that most precious of all qualities, personality. The capacity of the man himself is only revealed when, under stress and responsibility, he breaks through his educational shell and he may then be a splendid surprise to himself no less than to his teachers.—Cushing Harvey, *Consecratio Medici and Other Papers*. Boston: Little Brown & Co., 1928.

Council on Physical Therapy

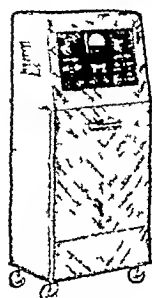
THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS

HOWARD A. CARTER Secretary

ROSE CW-6 RADIATHERMY UNIT, ACCEPTABLE

Manufacturer The E J Rose Manufacturing Company, Los Angeles

The Rose CW-6 Radiathermy Unit is intended for medical and surgical uses. Several terminal outlets are provided so that the inductance cable, the conventional condenser electrode or surgical electrodes for cutting and coagulating may be employed. The circuit comprises a tuned plate tuned grid push-pull oscillating system and is the only unit offered by the Rose Company with rectifier tubes. The patient circuit is inductively coupled to the oscillator, with a variable condenser incorporated in the circuit for tuning purposes. The wavelength for the unit is approximately 13 meters.



Rose CW 6
Radiathermy
Unit

The input power required to operate the unit at full load is about 700 watts. Since no reliable means has been devised for true measurement of radiathermic output wattage, no claims for such are made. However, a phantom load test by means of electric light bulbs connected through condenser pick-up plates and arranged to activate a photo-electric cell and calibrated meter approximates 350 watts.

The temperature rise of the transformer, after two hours' continuous operation at full load, was within the limits of safety prescribed by the Council. Burns may be produced but

Eight observations were run with the inductance cable and eight with cuff electrodes. The subjects were eight healthy male medical students, four of whom were used for each method of application, two tests being made on each student for both methods. Temperature measurements were made with a thermocouple in the anterior portion of the thigh at depths of one-eighth inch, three-fourths inch and 2 inches or on the bone. These depths were measured from the skin straight in, that is, normal to the skin surface. In applying the inductive cable,

Averages for Eight Observations, Coil Technique

Deep Muscle		Subcutaneous		Skin		Oral	
Initial	Final	Initial	Final	Initial	Final	Initial	Final
100.1	102.7	98.4	105.8	93.6	101.8	98.5	99.9

Averages for Eight Observations, Cuff Technique

Deep Muscle		Subcutaneous		Skin		Oral	
Initial	Final	Initial	Final	Initial	Final	Initial	Final
99.2	103.5	98.4	104.7	93.1	101.4	98.4	98.8

approximately one inch of bath towel was wrapped round the thigh and it was held in place by approximately four wraps of the inductive cable. The averages for eight tests with first the inductance cable and next the cuff technique are given in the accompanying two tables.

The unit was investigated in a clinic acceptable to the Council and the report on its heating qualities was satisfactory. It was found to perform as successfully as other units of the same general type.

In view of the foregoing favorable report on the unit, the Council on Physical Therapy voted to include the Rose CW-6 machine in its list of accepted devices.

ALOE IMPROVED COLD RAY QUARTZ LAMPS ACCEPTABLE

Manufacturer The A S Aloe Company, 1819 Olive Street, St. Louis

The A S Aloe Company submitted five mercury glow ultra violet lamps to the Council, namely:

1 Improved Aloe Cold Ray Quartz Lamp, Model CF 7890, standard portable combination lamp with approximately 80 inches of quartz tubing in the body grid.

2 Model CF-7894, identical to the former except that no provision is made in the transformer for an official burner.

3 Model 87, large portable general body lamp with provision for an official burner.

4 Aloe Standard Pedestal Cold Ray Quartz Lamp

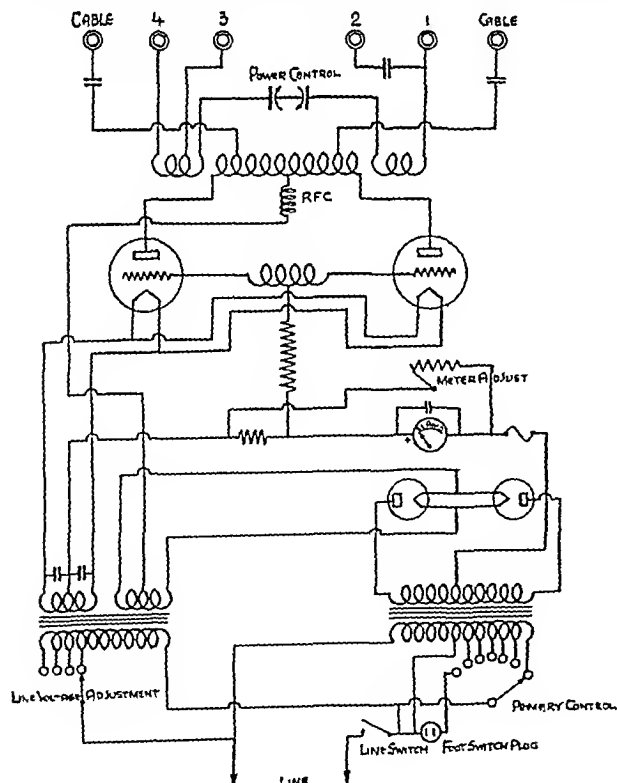
5 Aloe Standard Portable Cold Ray Quartz Lamp

The mercury glow type of ultraviolet burner is essentially a low vapor pressure, low amperage (0.015 ampere), high potential (5,000 volts, open circuit), glow discharge similar to a Geissler tube. The burner is of transparent tubing, quartz, highly evacuated and containing rare gases and a few drops of mercury. The power consumed is small and there is no great rise in temperature with this type of burner.

Of the total radiation of all wavelengths less than and including the line at 3,130 angstroms, more than 95 per cent is contained in the resonance emission line of mercury vapor at 2,537 angstroms. The erythemogenic efficiency of this type of lamp is high but that fact is not necessarily a criterion of its suitability for therapeutic purposes.

Therapeutically, the first three lamps mentioned generate sufficient intensity of ultraviolet radiation to produce a perceptible erythema on the average untanned skin in the following time-distance relationship:

Fifteen seconds at 12 inches from source to patient.
Forty seconds at 20 inches from source to patient.
Ninety seconds at 30 inches from source to patient.



Schematic Diagram of Circuit

can be avoided by ordinary precautions. They are less likely to occur with this type of machine than with conventional diathermy.

As is customary, the E J Rose Manufacturing Company was asked to submit evidence to substantiate its claims as to the heating ability of the unit on the living human thigh.

With the first two lamps, the orificial burner will produce an erythema on untanned skin as follows

Five seconds with burner in contact with skin
Fifteen seconds with burner 1 inch from skin

The Aloe Standard Pedestal and Portable Models (Nos 4 and 5 in this report) generate ultraviolet radiation of sufficient intensity to produce a perceptible erythema on the untanned skin in the following time-distance relationship

0.5 minute at 12 inches from source to patient
1.4 minutes at 20 inches from source to patient
3.1 minutes at 30 inches from source to patient

The orificial burner produces an erythema on untanned skin as follows

Five seconds with burner in contact with the skin
Fifteen seconds with burner at 1 inch from the skin

Since these lamps meet the standards for ultraviolet radiation set by the Council, it voted to include in its list of accepted devices the Improved Aloe Cold Ray Quartz Lamp Model CF-7890, Model CF-7894, Model 87, the Aloe Standard Pedestal and Portable Cold Ray Quartz Lamps for a period of one year

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH Secretary

AMINOACETIC ACID (See New and Nonofficial Remedies, 1937, p 48)

Aminoacetic Acid-Paul-Lewis—A brand of aminoacetic acid N N R

Manufactured by Paul Lewis Laboratories Inc Milwaukee Wis No U S patent or trademark

AMINOPHYLLINE (See New and Nonofficial Remedies, 1937, p 478)

Aminophyllin-Bischoff—A brand of aminophylline N N R

Manufactured by the Ernst Bischoff Co Inc New York No U S patent or trademark

Tablets Aminophyllin Bischoff 0.1 Gm (1½ grains)

Aminophyllin-Lederle—A brand of aminophylline-N N R

Manufactured by the Lederle Laboratories Inc Pearl River N Y No U S patent or trademark

Ampuls Solution Aminophyllin Lederle 0.24 Gm 10cc

Ampuls Solution Aminophyllin Lederle 0.48 Gm 2 cc

Tablets Aminophyllin Lederle 0.1 Gm (1½ grains)

STAPHYLOCOCCUS TOXOID (See New and Nonofficial Remedies 1937, p 405)

Mulford Biological Laboratories Sharp & Dohme, Philadelphia and Baltimore

Staphylococcus Toxoid Mulford—Prepared from staphylococcus toxin treated with formaldehyde and kept at 37°C until the toxin is reduced in skin necrotizing doses from more than 10,000 to less than 10 per cubic centimeter with the minimal lethal dose on rabbits almost entirely lost and the hemolysin titer originally 0.003 cc or less reduced so that 0.1 cc injected intradermally into previously tested rabbits produces no evidence of necrosis. The product is processed in two strengths dilution containing in each cubic centimeter the toxoid obtained from 100 necrotizing doses of toxin and dilution 2 containing in each cubic centimeter the toxoid obtained from 1,000 necrotizing doses of toxin. The requirements of toxigenicity and detoxification are from 10,000 or more skin necrotizing doses per cubic centimeter to less than 10 skin necrotizing doses per cubic centimeter from 300 to 1,000 or more minimum hemolytic doses per cubic centimeter to less than 10 per cubic centimeter from 20 or more minimal lethal doses per cubic centimeter for mice to less than one minimal lethal dose in 0.5 cc from 10 minimal lethal doses per cubic centimeter per kilogram for rabbits to less than one minimal lethal dose in 3 cc per kilogram. The skin necrotizing dose is that amount of toxin contained in 0.1 cc volume of staphylococcus toxin diluted in physiological solution of sodium chloride which injected into the skin of rabbit will at site of injection produce in forty-eight hours an area of necrosis 5 by 5 mm in diameter.

Staphylococcus toxoid Mulford is marketed in packages of one 5 cc vial each cubic centimeter containing the toxoid derived from 100 necrotizing doses of toxin and in packages of one 5 cc vial each cubic centimeter containing the toxoid derived from 1,000 necrotizing doses of toxin.

SODIUM CACODYLATE (See New and Nonofficial Remedies, 1937, p 94)

Ampoules Sodium Cacodylate Abbott 0.05 Gm (¾ grain) 1 cc

Prepared by the Abbott Laboratories North Chicago Ill

Ampoules Sodium Cacodylate Abbott 0.097 Gm (1½ grains) 1 cc

Prepared by the Abbott Laboratories North Chicago Ill

Ampoules Sodium Cacodylate Abbott 0.2 Gm (3 grains) 1 cc

Prepared by the Abbott Laboratories North Chicago Ill

Ampoules Sodium Cacodylate Abbott 0.524 Gm (5 grains) 1 cc

Prepared by the Abbott Laboratories North Chicago Ill

Ampoules Sodium Cacodylate Abbott 0.454 Gm (7 grains) 1 cc

Prepared by the Abbott Laboratories North Chicago Ill

Ampoules Sodium Cacodylate Abbott 0.975 Gm (15 grains) 2 cc

Prepared by the Abbott Laboratories North Chicago Ill

MERTHIOLATE (See New and Nonofficial Remedies, 1937, p 293)

The following dosage form has been accepted

Merthiolate Suppositories 1,000 Each suppository weighs approximately 10 Gm and contains merthiolate 1,000 in a glycerin and gelatin base consisting of 17.3 parts glycerin and 7.6 parts gelatin

ANAEROBIC ANTITOXIN (See New and Nonofficial Remedies, 1937, p 367)

Gilliland Laboratories, Inc, Marietta, Pa

Gas Gangrene Antitoxin Concentrated and Refined—An antitoxic serum prepared by immunizing horses against the toxins of *B. perfringens* (Cl welchii) and *Vibrio septique* (Cl septique). After the desired potencies have been obtained the horses are bled and the plasma is separated from the cellular elements. The antitoxin is concentrated and refined by fractional precipitation of the plasma with salts by a method similar to that used for the concentration of diphtheria antitoxin. Potency is determined according to the methods described by the National Institute of Health. Marketed in packages of one syringe or one vial containing 10,000 units of *B. perfringens* antitoxin and 10,000 units of *Vibrio septique* antitoxin. Each package contains a 1 cc vial of dilute (1:10) antitoxin for determination of sensitivity to horse protein.

Dosage—From 20,000 to 40,000 units or more intravenously supplemented with intramuscular administration. Dose may be repeated in from twelve to twenty-four hours depending on the symptoms and response to initial dose.

Tetanus Gas Gangrene Antitoxin Concentrated and Refined—An antitoxic serum prepared by immunizing horses against the toxins of *B. tetani* (Cl tetani), *B. perfringens* (Cl welchii) and *Vibrio septique* (Cl oedematis maligni). After the desired potencies have been obtained the horses are bled and the plasma is separated from the cellular elements. The antitoxin is concentrated and refined by fractional precipitation of the plasma with salts by a method similar to that used for the concentration of diphtheria antitoxin. Potency is determined according to the methods described by the National Institute of Health. Marketed in packages of one syringe or one vial containing 1,500 units of tetanus antitoxin, 2,000 units of *B. perfringens* antitoxin and 2,000 units of *Vibrio septique* antitoxin. Each package contains a 1 cc vial of dilute (1:10) antitoxin for determination of sensitivity to horse protein.

Dosage—For prophylaxis the contents of one syringe or vial intravenously or intramuscularly depending on the incubation period. As indicated by severity of the wound this dose should be repeated two or even three times at intervals of several days. Local infiltration of the wound may be advisable.

METRAZOL (See New and Nonofficial Remedies, 1937, p 301)

The following dosage form has been accepted

Metrazol Ampules 5 cc Each cubic centimeter contains 1½ grains of metrazol in aqueous solution with 0.1 per cent sodium phosphate

EPHEDRINE (See New and Nonofficial Remedies, 1937, p 215)

Ephedrine-Sharp & Dohme—A brand of ephedrine-U S P

Manufactured by Sharp & Dohme Philadelphia and Baltimore No U S patent or trademark

EPHEDRINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1937, p 218)

Ephedrine Hydrochloride-Sharp & Dohme—A brand of ephedrine hydrochloride-U S P

Manufactured by Sharp & Dohme Philadelphia and Baltimore No U S patent or trademark

Capsules Ephedrine Hydrochloride Sharp & Dohme ½ grain

Solution Ephedrine Hydrochloride Sharp & Dohme 5% It is preserved with chlorbutanol 0.5%

EPHEDRINE SULFATE (See New and Nonofficial Remedies, 1937, p 220)

Ephedrine Sulfate Sharp & Dohme—A brand of ephedrine sulfate-U S P

Manufactured by Sharp & Dohme Philadelphia and Baltimore No U S patent or trademark

Ampoules Ephedrine Sulfate Sharp & Dohme 1 cc ¼ grain

Capsules Ephedrine Sulfate Sharp & Dohme ½ grain

Capsules Ephedrine Sulfate Sharp & Dohme 4 grain

Solution Ephedrine Sulfate Sharp & Dohme 5% It is preserved with chlorbutanol 0.5%

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - CHICAGO, ILL

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SATURDAY, JANUARY 8, 1938

MEDICINE AT THE NEW YORK AND SAN FRANCISCO EXPOSITIONS

Featured among the events of 1939 will be the two great expositions of the world's progress already scheduled for New York City and San Francisco. Plans have been fully completed, administration buildings have already been constructed. Sufficient progress has already been made to indicate the successful development of these great expositions according to the plans outlined.

By action of the Board of Trustees of the American Medical Association the physicians of this country will be represented in each of these great expositions by special exhibits. At the San Francisco exposition the American Medical Association will have the space fronting directly on the main entrance, there it will assemble a demonstration of the accomplishments of scientific medicine, particularly in the Pan-Pacific area. The progress made in overcoming and controlling plague, tularemia, leprosy and other disease menaces of the Far East should show to the public the reliance that may be placed on scientific medicine for its protection.

At the New York exposition the special committee in charge of the building to be devoted to medical science has evolved a new plan, idealistic in its conception and unique for such events. If it succeeds, it is likely to develop a new trend in such displays. Briefly, it is proposed that the progress of scientific medicine shall be revealed in demonstrations devoted to various diseases and special topics, each of the exhibits being in charge of a scientific committee chosen especially for that purpose and each of the exhibits being sponsored by a commercial sponsor who will be represented in the main exhibit only by a sign giving credit to him for his sponsorship. Such exploitation of commercial products as may occur will be wholly within a special section of the medical science building, planned as a professional club, to which section only physicians will be admitted.

The section of the exhibit in New York to be sponsored and developed by the American Medical Association will be devoted wholly to medical education,

indicating how the Council on Medical Education at Hospitals and other activities of the American Medical Association have been vital since 1847 in raising the standard of medical education in the United States, improving the quality of medical service for the public and educating people as to what scientific medicine has done and can do for them. This work for the advancement of medical education is a demonstration of the manner in which a voluntary organization, working only by the forces of public education and publicity, is able to accomplish an important result for the public good. Thus the exhibit will give to the general public a double lesson much needed at this time. A feature of the medical building will be a mural decoration outlining the history of the advancement of medical science.

In its work of education of the people the American Medical Association is today availing itself of every possible modern means. Its contacts with the press, as revealed by the recently published report on the first press conference held in the headquarters office, its use of the radio both for national and for local broadcasts, its multiple appearances in great periodicals, and activities already in progress for greater utilization of the motion picture are an indication of the manner in which modern medicine may make itself apparent and audible to the vast majority of the intelligent public. It is significant that the British Medical Association has recently established a special bureau of public relations in an endeavor to achieve in Great Britain a service and a relationship similar to that developed by the American Medical Association in this country.

IRRADIATION OF CANCER OF THE BREAST

Fundamental in the surgical treatment of a malignant neoplasm is the widest possible removal of the primary growth together with its regional metastases. The standardized radical operation for cancer of the breast may be said to date from the publication in 1894 by William Stewart Halsted of his method. The operation included a careful clearance of the axillary contents, the removal of the supraclavicular lymph node, and the removal of the breast and of the pectoralis major muscle. In the later modification of the Halsted operation the dissection of the supraclavicular lymph nodes is omitted, but emphasis is placed on the removal of both pectoral muscles and the widest possible removal of the skin and fascia, frequently necessitating skin grafting to complete the healing of the denuded area. Obviously it would be impossible to go further in the direction of radical surgery.

While statistics accumulated in the course of the past quarter of a century show some improvement in the results, they are, on the whole, disappointing. According to Harrington,¹ 4,628 patients with cancer of the

¹ Harrington, Stuart W. Carcinoma of the Breast. Results of Surgical Treatment When the Carcinoma Occurred in the Course of Pregnancy or Lactation and When the Pregnancy Occurred Subsequent to Operation (1910-1933). Ann Surg 106:690 (Oct.) 1937.

breast were operated on at the Mayo Clinic between 1910 and 1933. Of these, 63.8 per cent had axillary metastases and 36.2 per cent did not. The total three year survivals amounted to 56.4 per cent, while the total of five year survivals amounted to 43.6 per cent. Three year survivals of patients without axillary involvement reached 82.1 per cent, while those with axillary metastases had a survival rate of 41.9 per cent. The rate of five year survivals in the group free from axillary metastases was 72.1 per cent and of those with axillary involvement 28 per cent. Other large series present a somewhat lower survival rate, the average being somewhere between 43 and 56 per cent for the total three year period and from 30 to 43 per cent for the five year period.

Late diagnosis, incomplete operations, extension along lymphatic paths which are not accessible to the surgeon, and distant metastases were held responsible for the failure to accomplish better results. The discouraging aspect of the problem, well known to every surgeon, is the not too infrequent appearance of early metastases after the most radical removal for a small tumor and in the absence of axillary involvement.

Surgeons and radiologists, therefore, sought to improve their results by recourse to the new and powerful therapeutic agent irradiation. Various combinations have been utilized: (1) radical operation combined with postoperative irradiation, (2) radical operation combined with preoperative irradiation, (3) radical operation combined with both preoperative and postoperative irradiation, (4) incomplete surgical operation followed by irradiation, and (5) irradiation alone. Inoperable cases are of course a proper field for irradiation, since it accomplishes palliation of pain, retardation of the growth of the tumor and an occasional prolongation of life beyond anticipation. Postoperative irradiation has won considerable favor with American surgeons. According to Adair,² radical mastectomy followed by two high voltage roentgen cycles gave 72 per cent of five year cures when the disease was confined to the breast alone and 23 per cent in cases of axillary involvement, as compared with the earlier figures of 70 per cent and 20 per cent respectively. This improvement over radical surgery should be credited to the added irradiation. Grace and Moutrier³ reported forty cases in which simple mastectomy was practiced. All the patients in this group received high voltage roentgen therapy during the entire period of postoperative life. They have obtained 52.9 per cent of three year cures and 44.1 per cent of survivals at the end of five years. These authors conclude that with adequate roentgen therapy and simple mastectomy it is possible to produce end

results which are as satisfactory as those of any of the other procedures in practice at the present time.

The method of preoperative irradiation creates a problem of its own. If it is effective it is necessary as Adair points out, to allow not less than two months after the completion of the treatment for radiation to become fully effective in producing the desired tissue changes. The question therefore arises whether the rate of tumor destruction exceeds the rate of tumor growth while the treatment is being carried out. It has been a common observation that the effect of irradiation on the axillary lymph nodes is much less than that on the breast. Adair found that in only three of the thirty-nine patients with involved lymph nodes treated by x-rays was there complete microscopic disappearance of cancer cells. Since almost half the patients are first seen with axillary involvement, the weak link in the chain is the inability of external irradiation to destroy cancerous invasion of the axilla. With the use of both external and interstitial irradiation as a complete therapy, according to Adair, 48 per cent of three year cures were obtained when the carcinoma was confined to the breast as contrasted with 72 per cent obtained by the radical operation and combined with postoperative irradiation. No five year cures were secured in cases of axillary involvement, whereas there were 23 per cent of cures in these cases treated by medical operation and postoperative irradiation. Preoperative irradiation either by x-rays or by the radium pack resulted in a definite reduction in the volume of the breast tumor and in a lesser extent of the axillary involvement. Adair's microscopic studies revealed no biologic difference in the two types of irradiation. Distressing skin ulcerations occurred after heavy doses of the radium pack.

In contradistinction to the disappointing results obtained by Adair from radiation alone are those of Geoffrey Keynes.⁴ In his report on 250 cases treated by interstitial irradiation either alone or combined at most with the removal of a bulky tumor of the breast but never dissection of the axilla he lists results which were somewhat better than those obtained by radical surgery in the same institution (the University College Hospital, London). Thus in the group of eighty-five patients in whom the breast alone was involved, the three year cures amounted to 83.5 per cent and the five year cures to 71.4 per cent. Keynes sees the following advantages in conservative treatment: (1) There is no operative mortality, (2) lymphatic edema of the arm is absent, (3) widespread local recurrences, such as are sometimes seen after a radical operation, are very uncommon, and (4) patients submit more readily to this treatment than to surgical operation because they are to be spared the mutilation entailed by the surgical procedure. Among the disadvantages he mentioned the difficulty of inter-

² Adair, Frank E. The Effect of Preoperative Irradiation in Primary Operable Cancer of the Breast. *Am J Roentgenol* 35: 559 (March) 1936.

³ Grace, Edwin J. and Moutrier, William. Simple Mastectomy with X Rays in Treatment of Cancer of the Breast. *New York State J Med* 36: 701 (May 1) 1936.

⁴ Keynes, Geoffrey. The Place of Radium in the Treatment of Cancer of the Breast. *Ann Surg* 106: 619 (Oct) 1937.

preting results. The radiation fibrosis frequently results in formation of fibrous lumps, particularly in the axilla, which are difficult to differentiate from recurrence. There is an increased liability to neuralgia or rheumatic pains in the treated area. On the other hand McKittrick,⁵ reporting ninety-six cases of treatment at the Palmer Memorial Hospital (Boston) by the interstitial irradiation technic of Keynes, concludes that "the finding of viable cancer cells in surgical and in autopsy specimens, the pain in and fixation of the pectoral region and the late deformity of the breast after radiation represents hazards which in our minds render this form of treatment less desirable than surgery in cases of primary operable cancer of the breast. It cannot be depended upon to protect the axilla against metastatic invasion."

The choice of treatment applicable to a given cancer, according to Coutard,⁶ depends on the diagnosis of the degree of differentiation of the cancerous cells and the knowledge of the degree of fibrosclerotic transformation of the vasculoconnective tissue. The biologic effects of irradiation are those of the destruction of neoplastic cells and of the fibrosclerosing effect on the vasculoconnective tissue. Both effects are clearly appreciable within two weeks after the beginning of treatment. Coutard points out that cells of adenocarcinoma are able to remain for years enclosed within the fibrosclerotic tissue the result of irradiation from an external source. Thus Ewing reported the case of a woman irradiated for cancer of the breast and considered cured. Many years later she was killed in an accident, and necropsy of the previously treated breast revealed groups of neoplastic cells living enclosed within a fibrosclerotic capsule.

In addition to a technically operable cancer Coutard adds the concept of a biologically operable one, thus a tumor with slightly differentiated cells developing in a loose nonfibrous tissue is not suitable for surgery even though technically operable because of its tendency to rapid cellular multiplication and the immediate dissemination of the cells. Such tumors are most often accompanied by adenopathy. This is the radiosensitive type. Another type of tumor, from the therapeutic point of view, is that consisting of differentiated cells developing in fibrosclerotic connective tissues. They are more or less radio-insensitive. When technically operable they belong to the domain of surgery, because the cells multiply slowly, have only a slight tendency to dissemination and develop adenopathy rarely or late. Between these two sharply differentiated types are to be found intermediate cases difficult to differentiate. For these, a combination of surgery and irradiation is indicated.

Because of the frequent association of both young and undifferentiated cells with adult cells, Coutard

considers it rational to irradiate first and operate later. Irradiation here destroys the cells most dangerous to the surgeon and leaves unmodified the cells of lesser activity. Coutard's method of preoperative irradiation consists in giving daily small fractional x-ray doses, from 300 to 400 roentgens, for from ten to twelve days. The surgical intervention must follow not later than the twentieth day before the possible appearance of new young cells. Coutard believes that in any combination of surgery and irradiation it is more efficacious to precede rather than to follow. He concludes that, since irradiation alone has not yet produced the cure of an appreciable number of inoperable adenocarcinomas over a period longer than five years, those tumors which are technically and biologically operable should by preference be operated on, as a rule, after a moderate external irradiation.

The weakness of radiation therapy in the final analysis is due to our inability to estimate the reactivity of connective tissue and to evaluate the presence of mitosis or of cicatrization.

Current Comment

DOES FEDERAL SUBSIDY MEAN FEDERAL CONTROL?

The assertion in *THE JOURNAL* that there is inherent danger in the acceptance of federal subsidies without absolute assurance of the avoidance of federal control has been met in many places by the assertion that such fears are unwarranted and by denial even of the possibility. Now there comes from the Grange trustee of Cornell University a charge of federal pressure in relationship to the conduct of agriculture research and education, which should prove to the doubters that the danger actually exists. According to the *New York Times*, H. E. Babcock of Ithaca on December 13 told the New York State Grange that the federal government was exerting constant pressure on Cornell University in seeking to have more and more to say about the conduct of agricultural research and education. The *New York Times* report continues:

"I do not need to point out to you that the federal government, mainly by the device of furnishing funds, has intruded its management into every sort of activity during the last few years," said Mr. Babcock, who is a Grange trustee for Cornell.

"It even influences you and me in the management of our farms by paying us to do this and that."

He expressed the fear that unless the "constant pressure" [on Cornell] was checked it will lead us into complication and difficulties and I, therefore, have been very alert and shall continue to be alert to keep the management of the university within the state, even if necessary at the cost of revenue if it comes from federal sources.

He expressed the belief that research and teaching at Cornell had waned and attributed this to "ascendancy in national agricultural affairs of a Secretary of Agriculture with a strictly Midwestern point of view, and with farm leadership having been more or less grabbed by a national farm organization under leaders who represent strictly Midwestern and Southern points of view."

⁵ McKittrick, Ireland. Interstitial Radiation of Cancer of the Breast. *Ann. Surg.* **106**: 631 (Oct.) 1937.

⁶ Coutard, Henri. The Results and Methods of Treatment of Cancer by Radiation. *Ann. Surg.* **106**: 584 (Oct.) 1937.

VIOSTEROL AND PSORIASIS

The successful treatment of psoriasis is so difficult that the recent report of Ceder and Zon¹ in this connection is arresting. These investigators administered massive doses of viosterol without local treatment of the lesions, dietary adjustment or any other therapeutic measure. A series of fifteen patients from 30 to 50 years of age with chronic widespread psoriasis were given from 300,000 to 400,000 units of vitamin D as viosterol. Eleven of the fifteen subjects showed complete involution of the psoriasis within six to twelve weeks' time. Care was exercised to guard against possible hypervitaminosis, by weekly determinations of the concentration of calcium in the blood and urine. At the end of the period of treatment, three patients showed incipient symptoms of excessive vitamin D dosage. All the subjects exhibited an elevation in the level of blood calcium. After cessation of treatment there was a recurrence in some of the patients, though the degree of severity was much less than originally observed. Although there is a wide difference in toxicity of viosterol in the young and in the adult human subject and the proposed treatment would therefore appear to be safe, the authors suggest not only that there may be a smaller effective dose of viosterol but also that certain accompanying products of the irradiation of the ergosterol may be the potent factor. Obviously much more extended studies are necessary to permit positive conclusions.

Association News

THE SAN FRANCISCO SESSION

Special Exhibit on Anesthesia in the Scientific Exhibit

A special exhibit on anesthesia will be shown in the Scientific Exhibit at the San Francisco session under the auspices of a committee composed of Dr. Ralph M. Waters, Madison, Wis., chairman, Dr. P. J. Hanzlik, San Francisco, Dr. Chauncey D. Leake, San Francisco, and Dr. Philip D. Woodbridge, Boston.

Application blanks for space in the Scientific Exhibit for other exhibits are now available and may be obtained from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

RADIO BROADCASTS

The American Medical Association and the National Broadcasting Company present the fifth series of network health programs, beginning Oct. 13, 1937 and running weekly through June 15, 1938. The programs are presented over the Red network each Wednesday at 2 p. m. eastern standard time, 1 p. m. central standard time, 12 o'clock noon mountain standard time and 11 a. m. Pacific standard time.

The dates and topics of the broadcasts for the coming months are as follows:

Contagious Diseases

January 12—Scarlet Fever, Measles and Whooping Cough—modern attitudes toward these diseases—their prevention by community cooperation.

January 19—Smallpox and Diphtheria—unnecessary diseases preventable by immunization of infants.

January 26—Polio-myelitis—information about the disease, cooperation with President's birthday ball.

Preventing Future Illness

February 2—Rheumatism and Arthritis—known factors in the causation of arthritis and its care.

The stations on the Red network are privileged to broadcast the program but, since it is a noncommercial program, they are not obliged to do so. Interest on the part of medical societies, women's auxiliaries and others may have weight with program directors of local stations. A personal visit to the program director might be advisable if the program is not being taken by a local station. This is an opportunity for the appropriate committees of county medical societies to indicate their interest in having this program broadcast in their community and to enlist the interest of other groups.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Society News—Dr. William Nicholson Jones, Birmingham, addressed the Etowah County Medical Society in Gadsden November 16 on "Importance of Endometrial Studies in the Management of Functional Menorrhagia," and Dr. James O. Finney, Gadsden, "Modern Antisyphilitic Therapy."

Personal—Dr. Julius E. Dunn, Fort Payne, for two years health officer of DeKalb County, has been appointed to a similar position in Lauderdale County, with headquarters at Florence.—Dr. Samuel D. Sturkie, formerly of Oneonta, has been appointed health officer of Chilton County, succeeding Dr. John M. Kimmey, Clanton, who resigned to accept a similar position in Calhoun County.

ARIZONA

Personal—Dr. Orville H. Brown, Phoenix, Ariz., has resigned as editor of *Southwestern Medicine* and Dr. Maurice P. Spearman, El Paso, Texas, has been appointed to succeed him. Dr. Spearman is 34 years old and graduated from Baylor University College of Medicine, Dallas, Texas, in 1934.

CALIFORNIA

Gastro-Enteritis Outbreaks—Three outbreaks of gastroenteritis were reported to the state department of health recently, involving fifty cases, mostly in children, in Riverside County, twenty-five employees of an institution in Mendocino County, and forty-three children in a Colusa County school. An investigation did not reveal the sources of the outbreaks.

State Association News—The county medical societies of Riverside, San Bernardino, Orange, Imperial and San Diego held "state association nights" January 4-10. Various officers of the state medical association, including Drs. William W. Roblee, Riverside, president-elect, Lowell S. Gorn, Los Angeles, speaker of the house of delegates, Calvert L. Emmons, Ontario, and Chester O. Tanner, San Diego, councilors, and Frederick C. Warnshuis, secretary, were the speakers. The state association will sponsor a three weeks all expense Mexican tour leaving San Francisco by special train February 11. It is limited to physicians and dentists and their immediate families.

Human Death from Rabies—A veterinarian living in Los Angeles County died from rabies October 18. While administering an antidote to a small dog for suspected arsenic poisoning, July 19, the veterinarian was bitten on both thumbs. The animal died the following day and the head taken to a laboratory was found positive for rabies. The Pasteur treatment was administered to the veterinarian within twenty-four hours. About October 12 or 13 the patient suffered from headache and from pain in his hand and arm and was unable to sleep. He became progressively worse and died October 18. The antirabies serum was manufactured by a reliable firm and had been kept under proper refrigeration. According to the state department of health it would seem probable that the cauterization of the wound was late and did not destroy the virus under the thumb nail that had been pierced by the dog's teeth.

¹ Ceder, E. T. and Zon, Leo. Pub. Health Rept. 32:1:80 (Nov.)

IDAHO

Changes in Health Officers—Dr Howard L. McMartin, recently appointed health officer of the Twin Falls district has been made head of the division of maternal and child welfare in the state department of health. Dr Robert B. Stump, formerly of Cleveland, will succeed Dr McMartin at Twin Falls.

Society News—Dr Oza J. LaBarge, Salt Lake City, addressed the Pocatello Medical Society December 2, his subject was "Clinical Significance and Treatment of Auricular Fibrillation." Officers of the society elected at this meeting are Drs Dan C. McDougall, president, George G. Fitz, Bancroft, vice president, and Ben C. Eisenberg, secretary-treasurer. Drs Bernard P. Mullen and Ralph H. Loe, Seattle, addressed the North Idaho District Medical Society in Lewiston recently on "Management of Adhesions" and "The Value of Gastrosocopy" respectively. Dr Francis A. Goeltz, Salt Lake City, addressed the South Side Medical Society in Burley recently on treatment of urinary infections.

IOWA

Physician Honored—Dr and Mrs Samuel K. Davis, Libertyville, were entertained at a dinner recently by members of the Jefferson County Medical Society honoring Dr Davis for nearly half a century of medical practice. A desk set was presented to Dr Davis and a basket of flowers to his wife. Dr James S. Gaumer, Fairfield, was toastmaster, and speakers included Dr Harold A. Spilman, Ottumwa, Charles H. Carter, Ph.D., Fairfield, Dr James Frederic Clarke, and Dr Davis's son, Dr Austin Clifford Davis, Rochester, Minn. Dr Davis graduated at the Keokuk College of Physicians and Surgeons in 1888, he served as secretary of the Jefferson County Medical Society in 1915 and is now president of the local school board.

Society News—Dr Cecil C. Jones discussed "The Relationship between General Medicine and the Eye, Ear, Nose and Throat" before the Polk County Medical Society and the Des Moines Academy of Medicine in Des Moines, December 14, and Dr Hiram B. Henry, "Psychiatry and Medicine." At a meeting, November 30, speakers were Drs John Russell on "Collapse Therapy in Pulmonary Tuberculosis" and Arnold M. Gordon, "Lesions of the Esophagus." Dr Frederic J. Cotton, Boston, discussed "Fractures and the General Practitioner" before the Linn County Medical Society in Cedar Rapids, December 9, and Dr Edwin B. McConkie, Cedar Rapids, "Treatment of Essential Thrombocytopenia with a Report of a Case Treated by Splenectomy." The Pottawattamie County Medical Society was addressed in Council Bluffs, December 6, by Drs Frank R. Peterson, Iowa City, on "Hand Infections," Michael J. Carey, Council Bluffs, "Spontaneous Pneumothorax," and Gordon N. Best, Council Bluffs, "Duodenal Obstruction." Dr Clifford W. Losh, Des Moines, was elected president of the Iowa State Urological Society at its annual meeting in Des Moines, December 4.

KANSAS

Personal—Dr Willis L. Jacobus Jr., Ottawa, has been appointed health commissioner of Franklin County to fill the unexpired term of his father, the late Dr Willis L. Jacobus. Dr Otto A. L. Hennerich, Hays, was guest of honor at a dinner recently given in recognition of his completion of twenty-five years' service on the staff of St. Anthony's Hospital.

LOUISIANA

Educational Symposiums—A series of educational symposiums will mark the formal inauguration exercises of Rufus Carrollton Harris, LL.D., as the tenth president of Tulane University of Louisiana, New Orleans, January 16-18. The subjects will be education for women, legal education, the liberal arts college, graduate education and medical education. In the last named the speakers will be Dr Waller Smith Leathers, dean, Vanderbilt University School of Medicine, Nashville, Tenn., and Alphonse M. Schwitalla, S.J., dean, St. Louis University School of Medicine. Dr Charles C. Bass, dean of the medical school at Tulane, will preside.

MASSACHUSETTS

Grant to Continue Study of Alcoholism—The Works Progress Administration has appropriated \$27,121 to continue the study of alcoholism at the Boston City Hospital under the direction of Dr Merrill Moore. Begun early in 1937 with an original allocation of about \$44,000, the study seeks to determine the causes, costs and consequences of alcoholism.

Society News—Dr Merrill Moore discussed "The Study of Alcoholic Problems" before the Essex South District Medical Society in Danvers, January 5. Dr Benedict F. Boland, Boston, addressed the New England Society of Physical Medicine, December 15, on "Infections of the Uterine Cervix and Their Treatment by Electrosurgical Methods." At a meeting of the New England Heart Association, December 13 in Boston, the speakers included Drs George Kenneth Mallory, Brookline, and Chester S. Keefer, Boston, on "The Myocardium in Fatal Cases of Hemolytic Streptococcus Infections" and Eugene A. Stead Jr. and Paul Kunkel, "The Effect of Epinephrine and Pitressin in Circulatory Collapse."

Free Public Lectures—The annual course of free public lectures at Harvard University Medical School will begin January 9 with a lecture by Dr Harry R. DeSilva on "Men, Motor Cars and Alcohol." Other lecturers in the series are:

Dr Shields Warren, January 16, Cancer.
Paul E. Boyle, D.M.D., January 23, Teeth: Deciduous, Permanent and Artificial.
Dr Frederick F. Russell, January 30, Progress in Preventive Medicine.
Dr Maxwell Finland, February 6, Colds, Influenza and Pneumonia.
Dr John Rock, February 13, Menstrual Disorders and the Menopause (for women only).
Dr Frank Dennette Adams, February 20, Overweight and Underweight.
Drs Changung Frothingham and Richard H. Miller, February 27, Pain in the Abdomen.
Dr Heerman L. Blumgart, March 6, Heart Disease.
Dr Merrill Moore, March 13, Nervous Fatigue.
Dr Reginald Fitz, March 20, The Family Medicine Cabinet: How Remedies and When to Use Them.
Dr Walter Bauer, March 27, Arthritis.

MICHIGAN

Personal—Mr Frank Bateman has been appointed business manager of the *Bulletin* of the Oakland County Medical Society. Dr Jerome F. Berry, Kalamazoo, has been appointed a member of the recently created Michigan State Hospital Commission, it is reported. Dr Louis J. Yglesias, assistant professor of surgery, University of Michigan Medical School, Ann Arbor, has resigned to enter private practice in Havana, Cuba. Dr C. C. Chang has joined the department of surgery as assistant in the division of thoracic surgery, under the auspices of the Rockefeller Foundation, the University Hospital *Bulletin* reports.

Pediatric and Infectious Disease Society—The sixteenth annual meeting of the University of Michigan Pediatric and Infectious Disease Society was held at the University Hospital, Ann Arbor, November 19-20. The speakers included:
Dr Damon O. Walthall, Kansas City, Mo., Malignancy in Infancy.
Dr Harry A. Towsley and John J. Engelbried, Ann Arbor, Observations on the Clinical Use of Sulfanilamide in Infections.
Dr Louis Harley, Ann Arbor, The Use of Cervitamic Acid in the Treatment of Infantile Scoury.

The program included a symposium on respirator, diseases with Dr Roy M. Greenthal, Milwaukee, Dr Carleton B. Pierce, Dr Walter J. Nungester and Roy G. Klesper, and Dr Franklin J. Mellencamp, Ann Arbor, as the speakers. Officers of the society are Drs Moses Cooperstock, Marquette, president, William S. O'Donnell, Detroit, vice president, and David Murray Cowie, Ann Arbor, secretary.

New State Health Officer—Dr Don W. Gudakunst, deputy commissioner and director of school health service of the Detroit Department of Health, has been appointed state health officer, succeeding Dr Clyde C. Stemons, effective February 1. A native of Paulding, Ohio, Dr Gudakunst graduated at the University of Michigan Medical School, Ann Arbor, in 1919 and is now professor and chairman of the department of preventive medicine and public health on a part time basis at Wayne University School of Medicine, Detroit. Dr Stemons has been health commissioner of Michigan since 1930. He was born in Cedar Springs in 1874 and graduated at the Detroit College of Medicine and Surgery in 1905. He was commissioner of schools in Wexford County from 1899 to 1903 and health officer of the city of Grand Rapids from 1909 until 1930.

MINNESOTA

Society News—Dr Sidney A. Slater, Worthington, was elected president of the Minnesota Public Health Association at the annual meeting in November. Dr Carl V. Weller, Ann Arbor, Mich., addressed the Hennepin County Medical Society, Minneapolis, December 6 on "Intrinsic Factors in the Causation of Cancer." Dr Frederick J. Taussig, St. Louis, discussed "The Prevention of Abortion," before the society, January 3. At a meeting of the Minneapolis Surgical Society, January 6, the speakers were Drs Stanley R. Maxemer on "Autogenous Fascial Transplants," Herman O. McPheters, "Femoral Thrombophlebitis," Arthur F. Bratrud, "Nerve Suture and Plastic Repair for Deformity of the Hand and

Owen H. Wangersteen, "Therapeutic Agents in the Management of Acute Infections of Extremities." All are of Minneapolis—Dr Ernst Gellhorn, Chicago, addressed the Minnesota Pathological Society in Minneapolis December 21, on "The Pathologic Physiology of Anoxia of the Central Nervous System"—Dr Byrl R. Kirklin addressed the Redwood-Brown County Medical Society in New Ulm December 8 on "Roentgenologic Diagnosis of Gastro-Intestinal Lesions."

NEW JERSEY

Clinical Pathologists Organize—The New Jersey Society of Clinical Pathologists was recently formed with Dr Asher Yaguda, Newark, as president. Dr Robert A. Kilduffe, Atlantic City, is vice president and Dr Arthur J. Casselman, Camden, secretary.

Society News—A symposium on sulfanilamide was presented before the Hudson County Medical Society, Jersey City, January 4, by Drs Perrin H. Long, Baltimore, Nicholas M. Alter, James F. Norton, Jersey City, and Traugott J. Schuck, Hoboken—Dr Arthur C. Morgan, Philadelphia, addressed the Gloucester County Medical Society, Woodbury, December 16, on "Acute Cardiac Tragedies."

NEW YORK

Graduate Course at Hudson—The council committee on medical education of the Medical Society of the State of New York is sponsoring a course on "Treatment of Common Diseases" given by Buffalo physicians at the Hudson City Hospital. The lectures are as follows:

Dr Abraham H. Aaron, December 20, Measures for the Relief of Distress Following Myocardial Infarction
Dr Nelson G. Russell, January 10, Treatment of Edema
Dr Clayton W. Greene, January 24, What Can We Do for Angina Pectoris and Coronary Occlusion?
Dr Elmer H. Heath, February 7, Dyspnea and Its Treatment
Dr Francis D. Leopold, February 21, Modern Methods in the Treatment of Anemia
Dr Edward A. Sharp, March 7, Diagnosis and Treatment of Unconscious States

Society News—Dr Daniel C. Patterson, Bridgeport, Conn., addressed the Dutchess County Medical Society, Poughkeepsie, December 8, on "Injection Treatment of Hernia."—Drs Arthur H. Paine and Clarence H. Peachey, Rochester, addressed the Wayne County Medical Society, Lyons, December 7, on "Undiagnosed and Misdiagnosed Genito-Urinary Pathology" and "The Common Skin Diseases and Their Treatment," respectively—Drs Charles H. Goodrich, Brooklyn, president of the Medical Society of the State of New York, and Howard F. Root, Boston, addressed the Rensselaer County Medical Society, Troy, December 14, on "Preventive Medicine—An Evaluation of General Management" and "Recent Advances in Endocrinology with Special Reference to Diabetes," respectively.

New York City

Memorial to Dr Warren—The Brooklyn Home for Consumptives held a memorial service for Dr Luther F. Warren, December 5, and dedicated a library on tuberculosis named in his honor. Dr Warren was medical director of the home from 1932 until his death Jan. 18, 1937. He was professor of medicine at Long Island College of Medicine and physician in chief to the Long Island College Hospital.

Hospital News—Dr Irving S. Wright, chief of the vascular clinic, New York Post-Graduate Medical School and Hospital, delivered one of the Louis Adler Lectures in Cardiology at Manhattan General Hospital, November 29, on "Recent Advances in the Diagnosis and Treatment of Peripheral Vascular Diseases."—The Jewish Memorial Hospital has recently opened a new outpatient department of two floors with a fund of \$100,000 given by the Martha M. Hall Foundation as a memorial to William Henry Hall.

Lectures on Diabetes—The New York Diabetes Association has arranged a series of lectures for practicing physicians to be given on Thursday afternoons during January and February at the New York Academy of Medicine. They are as follows:

January 20, William H. Chambers, Ph.D., Physiology of Carbohydrate Metabolism
January 27, Dr Herman O. Mosenthal, Dietetic Management of Diabetes
February 3, Dr James Ralph Scott, Insulin and Protamine Insulin
February 10, Dr Dana W. Athley, Treatment of Diabetic Ketosis
February 17, Dr Beverly Chiew Smith, Gangrene Infection and the Management of the Surgical Diabetic
February 24, Dr George Baehr, Cardiovascular Diseases and Diabetes

Society News—Drs Harold Neuhoef and Howard Lilienthal addressed the New York Surgical Society, December 8, on "Excision of the Axillary Vein in the Radical Operation for

Carcinoma of the Breast" and "An Original Modification for the Incision in Lower Thoracoplasty," respectively.—The New York chapter of the International and Spanish-Speaking Association of Physicians and Dentists held its first meeting of the year November 26. A symposium on special surgery was presented by Dr Max Thorek, Chicago, Malcolm W. Carr, D.D.S., and Dr Howard Lilienthal, New York.—Dr John Alexander, Ann Arbor, Mich., addressed the Brooklyn Thoracic Society, December 17, on "Indications for Surgical Treatment of Acute Pulmonary Suppuration."—At the monthly meeting of the Medical Society of the County of New York, December 20, the speakers were John Kirkland Clark, Esq., on "Expert Medical Testimony," Elmer F. Andrews, state industrial commissioner, "Violations of the Workmen's Compensation Law," Bernard Botem, assistant district attorney of New York County, "Fraudulent Accident Claims," Dr David J. Kaliski, "Right of Physicians Under the Workmen's Compensation Law," and Sol Ullman, assistant attorney general, "Medical Grievance Committee and Fraudulent Medical Practices."

NORTH CAROLINA

Society News—Dr Casper W. Jennings, Greensboro, was elected president of the North Carolina Eye, Ear, Nose and Throat Society at the recent annual meeting in Charlotte. Dr Franklin C. Smith, Charlotte, is vice president and Dr Milton R. Gibson, Raleigh, is secretary.

Personal—Richard H. Shryock, Ph.D., professor of history, Duke University, Durham, received the Mayflower Cup awarded by the State Literary and Historical Association recently in Raleigh for his book "The Development of Modern Medicine," chosen as the 'outstanding book by a resident of the state this year.'

Gift for Medical Library—The University of North Carolina School of Medicine, Chapel Hill, has received a gift of \$1,000 from Mrs. Charles E. Kistler, Morganton, to be used toward the establishment of a Charles E. Kistler memorial library in the medical sciences, newspapers announced December 19. Mrs. Kistler made the gift in honor of the late Mr. Kistler, a graduate of the University who had a special interest in the medical school. She plans to make an annual gift of this amount, it was said.

OHIO

Dr Todd's Twenty-fifth Anniversary—Former students, present students, associates and friends of Dr Wingate Todd, professor of anatomy, Western Reserve University School of Medicine, Cleveland, gave a surprise tea in his laboratory December 15 in honor of his twenty-fifth anniversary as a member of the faculty. About 500 guests greeted Dr Todd, and on behalf of the staff of the anatomy department Dr James E. C. Hallisy presented to Dr Todd a number of books and etchings. Born in Sheffield, England, in 1885, Dr Todd was educated at the University of Manchester and London Hospital and was lecturer in anatomy at his alma mater when he was appointed at Western Reserve in 1912. He is also director of the Hamann Museum of Comparative Anthropology and Anatomy.

OKLAHOMA

Personal—Dr Orval L. Parsons, Lawton, has been appointed health superintendent of Comanche County to succeed Dr Lorin C. Knee, Lawton—Dr Giles E. Harris, Hugo, has been appointed health superintendent of Choctaw County to succeed Dr Walter N. John, Hugo, and Dr Forrest S. Etter, Bartlesville, has been appointed in Washington County.

TEXAS

Hospital News—A new psychopathic ward constructed at a cost of \$227,000 was opened at the Wichita Falls State Hospital in October, it is reported.—A twenty-bed hospital for Hutchinson County was opened at Borger in October. The site was donated by John F. Weatherly, Panhandle, and the building cost \$65,000. Many of the rooms were furnished by firms, individuals and clubs of Borger.

Society News—Drs John W. Torbett and Howard O. Smith, Marlin, addressed the Brown County Medical Society, Brownwood, November 8, on "Undulant Fever: Its Diagnosis and Treatment" and "Gastric Diseases Treated by Means of Surgery," respectively.—Drs Margie C. Carlisle and R. Wilson Crosthwaite, Waco, addressed the McLennan County Medical Society in Waco, November 9, on "Brucellosis and The Cervical Rib," respectively.—Drs Howard E. Lancaster and Ernest E. Miller, Beeville, addressed the Nueces County

Medical Society, Corpus Christi, November 9, on "Gallbladder Disease" and "Conservative Treatment of Otitis Media" respectively—Dr Benjamin M Primer, Amarillo, was elected president of the Texas Public Health Association at the annual meeting in Dallas in November—Dr Henry Grady Garrett, Dallas, among others, addressed the Dallas County Medical Society, January 13, on "The Therapy of Subacute and Chronic Gonococcal Infections by Means of Electropexia." At the meeting November 25 Dr Matthew Hill Metz presented a paper on "Peptic Ulcer Treatment by Posterior Pituitary Extract" and Dr Herbert F Laramore, El Paso, spoke on "Toxemias of Pregnancy."

VIRGINIA

Medical College Centennial—The Medical College of Virginia celebrated the one hundredth anniversary of its founding at the annual Founders' Day exercises December 7. Austin H. Clark, biologist of the staff of the Smithsonian Institution, Washington, D. C., gave the address at the ceremony on "Science in Colonial Virginia."

New Outpatient Clinic—The hospital division of the Medical College of Virginia recently announced that its new outpatient clinic would be completed in December. This building was erected at a cost of about \$550,000, of which \$300,000 was the gift of an anonymous donor and \$239,850 a grant from the Public Works Administration. The new clinic is eight stories high. The first floor will be used largely for administration, the second is for the medical department and the third is for the surgical department. The fourth floor will be devoted to biochemistry, the fifth to pathology and the sixth to bacteriology. For the present the seventh will be used for physical therapy and the eighth for office purposes.

WASHINGTON

Personal—Dr Norman E. Magnussen, formerly with the health department of Seattle, has been appointed health officer of Pierce County—Mrs James Tate Mason, Seattle, widow of the President of the American Medical Association at the time of his death, June 20, 1936, died suddenly in Portland, Ore., November 2, according to *Northwest Medicine*—Dr Arthur L. Ringle, Fresno, Calif., has been appointed health officer of Cowlitz County with headquarters in Kelso.

Society News—A symposium on urologic subjects was presented before the Pierce County Medical Society, Tacoma, recently by Drs Hiram S. Argue, Charles S. Pascoe, Charles F. Engels, Clyde Magill and George A. Moosey, all of Tacoma—Dr Frederick Lemere, Seattle, addressed the Thurston-Mason Counties Medical Society, Olympia, recently on insulin shock treatment of schizophrenia—Drs Harry L. Leavitt and Ralph H. Highmiller, of the state department of labor and industries, Seattle, recently addressed the Cowlitz County Medical Society in Longview and the Snohomish County Medical Society in Everett on relations of physicians to the department.

GENERAL

New Editor of Heart Journal—Dr Lewis A. Conner, professor of clinical medicine, Cornell University Medical College, New York, has retired as editor of the *American Heart Journal* after having served in that capacity since the establishment of the journal in 1925. Dr Fred M. Smith, professor of the theory and practice of medicine, State University of Iowa College of Medicine, Iowa City, will be the new editor with the following associate editors: Drs Horace M. Korns, Iowa City, Hugh McCulloch, St. Louis, and Irving S. Wright, New York.

Fraudulent Instrument Repair Man—Physicians in Virginia and North Carolina have recently reported being swindled by an instrument repair man. In Virginia he claimed to represent a firm called Rawlings and Company, Baltimore, and in North Carolina used the name Runyon and Company, Atlanta. His victims gave him instruments to be repaired and paid for the work in advance. After a reasonable length of time they wrote to the addresses given and received reports that there were no such concerns. He is reported as being small of stature with blue or gray eyes, slightly gray hair and wearing glasses. He claims to know many prominent surgeons.

Society News—The American Congress of Physical Therapy will hold its next annual session in the Palmer House, Chicago, September 12-15—The second annual Clinical Conference of Midwestern Radiologists will be held in the Muehlebach Hotel, Kansas City, Mo., February 11-12. The first

conference was held in Rochester, Minn., in February 1937—The fifteenth annual meeting of the American Orthopsychiatric Association will be held at the Stevens Hotel, Chicago, February 24-26—Dr Foster Kennedy, New York, was elected president of the Association for Research in Nervous and Mental Disease at its annual meeting in New York, December 28. Drs Karl M. Bowman, New York, and Tracy J. Putnam, Boston, were elected vice presidents.

Grants for Research—The American Academy of Arts and Sciences recently included in grants from its permanent science fund the following of medical interest:

Clarence C. Little, Sc.D., director, Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Me., \$1,000 to study the incidence of tumors and other growth abnormalities in a species cross in mice.

Karl E. Mason, Ph.D., associate professor of anatomy, Vanderbilt University School of Medicine, Nashville, Tenn., \$500 for technical assistance in the development and standardization of reliable methods for the routine assay of food substances for their vitamin E content.

William F. Windle, Ph.D., professor of microscopic anatomy, Northwestern University Medical School, Chicago, for a trained assistant in a study of neurologic factors in the development of fetal respiration and other fetal behavior.

National Medical Art Association Plans Exhibit—The American Physicians' Art Association, which was recently organized and now has about 400 members, plans to present the first national exhibit during the month of June at the San Francisco Museum of Art at the Veterans Auditorium. The association proposes to correlate the work of local art societies and to stimulate an interest in art among physicians throughout the country. All members of the American Medical Association who do any kind of art work (including photographic art) are invited to join the new art group and to submit work for the exhibit, which will be on view during the annual session of the Association, June 13-17. There are no dues. Any one interested is asked to communicate with Dr Francis H. Rede, will, secretary of the art association, Suite 521-536 Flood Building, San Francisco.

Fellowship for Study at Geneva—The Institute of International Education announces that a fellowship is available for postgraduate medical study at the University of Geneva, Switzerland, through the Swiss American Student Exchange, for the academic year 1938-1939. The stipend is 3,000 Swiss francs, which is considered sufficient to pay living expenses on a moderate scale. It does not cover steamship passage and incidental expenses and the appointee must pay the matriculation and semester fees at the university, amounting to about 60 Swiss francs, and any laboratory fees that may be required. Opportunity is offered for study in general medicine, ophthalmology, pathology and child psychology. To be eligible a candidate must be an American citizen with a degree from an approved medical school and an adequate command of the French language, written and spoken. Men or women may apply, preference will be given to unmarried candidates under 35 years of age. Applications with credentials must be filed by March 1 with the Institute of International Education, 2 West Forty-Fifth Street, New York.

International Congress in New York, 1939—The third International Congress for Microbiology will be held in New York, Sept. 2-9, 1939, at the Waldorf-Astoria, with Dr Thomas M. Rivers, New York, as president. The congress will meet in the following sections: general biology, variation and taxonomy, general biology, microbiological chemistry and physiology, viruses and viral diseases, Rickettsiae and rickettsial diseases, protozoology and parasitology, fungi and fungous diseases, medical and veterinary bacteriology, agricultural and industrial microbiology, and immunology. There will be a registration fee of \$5, which will not include the cost of a banquet ticket or a copy of the proceedings of the congress. The committee in charge urges that plans for attending should be made promptly in view of the world's fair in New York during the summer of 1939. The secretary of the congress is Dr Martin H. Dawson, 620 West One Hundred and Sixty-Eighth Street, New York, and the treasurer is Kenneth Goodner, Ph.D., Rockefeller Institute for Medical Research, York Avenue and Sixty-Sixth Street, New York.

Proposed Qualifications of Health Officers—The United States Conference of Mayors recently made public the report of a special board created early in 1937 to draw up qualifications that health commissioners in the larger cities should have. Appointment of the board was the first step in a program adopted by the mayors' conference to improve professional qualifications of municipal officers. Minimum requirements were outlined for three groups of cities. For a city of more than 500,000 the health officer should have graduated from a class A medical school and should have had not less than six years' full-time experience in public health work of which three

should have been in an administrative position, a course of one year in a recognized school of public health may be substituted for two of the three years of general experience. For a city with a population between 100,000 and 500,000, the health officer should have in addition to a medical degree four years' experience, one of which must be in administrative work, one year's course in public health may be substituted for two of the three years of general experience. For cities under 100,000 the board recommended that in addition to a medical degree the health officer should have not less than two years of experience in public health work or one year of experience and one year's course in public health at a recognized school. The board will act at the request of any city to determine whether a candidate meets these requirements. Members of the National Health Officers Qualifying Board are as follows: Drs Joseph W. Mountin, U S Public Health Service, chairman; Allen W. Freeman, professor of public health administration, Johns Hopkins University School of Hygiene and Public Health, Baltimore; John L. Rice, health commissioner of New York City; Wilson G. Smilie, professor of public health and preventive medicine, Cornell University Medical School, New York; Huntington Williams, health commissioner of Baltimore; Carl V. Reynolds, state health officer of North Carolina, Raleigh; and Edward S. Godfrey, health commissioner of New York state, Albany.

CANADA

New Officer of Grenfell Association—Dr Charles S. Curtis, medical superintendent of St. Anthony Hospital, sponsored by the International Grenfell Association at St. Anthony, Newfoundland, has been appointed medical superintendent and executive officer for the association on the coasts of Labrador and North Newfoundland, with jurisdiction over all the medical work of the organization. Sir Wilfred Grenfell, now 72 years old, remains as active superintendent but for reasons of health must now spend less time in the north. Dr Curtis is a native of Spencer, Mass., and graduated from Harvard University Medical School in 1913. He has been in charge of the hospital since 1917.

FOREIGN

The Croydon Typhoid Epidemic—The *Lancet* reported December 11 that the number of known or suspected cases of typhoid in an outbreak at Croydon first reported in November had reached 269. There had been seventeen deaths up to that time.

Wagner-Jauregg Honored by American Committee—An award of \$1,000 and a medal were presented to Prof. Julius Wagner-Jauregg, Vienna, by the Committee on Research in Syphilis through the Austrian consul general at a special meeting in New York November 24. The committee had voted to make the presentation several months hence, according to the *New York Times*, but arranged the ceremony in November hurriedly after it was learned that Professor Wagner-Jauregg, now 80 years old, was critically ill at his home in Vienna. The Austrian scientist was honored for his development of the malaria treatment of syphilis, for which he received the Nobel Prize in 1927. Among those present at the ceremony were Drs. William J. M. A. Maloney, chairman of the committee, William F. Snow, director general of the American Social Hygiene Association, Hubert S. Howe and Leopold Lichtwitz and Frau Sonia Weber, a niece of Dr. Wagner-Jauregg. The Committee on Research in Syphilis was organized in 1928 by a group of hygienists, acting in cooperation with the American Social Hygiene Association, to subsidize and develop clinical and laboratory research.

Epidemic Commission to Aid China—The League of Nations has appointed three groups of experts to give aid to Chinese authorities in organizing a campaign against epidemics in the war areas of China. The groups will not form a distinct international body operating in China but will be placed at the disposal of the government under the same conditions as advisers which the league has sent on former occasions. In their field work the groups will be mobile and will be provided with necessary equipment and emergency supplies, which will become the property of the Chinese government on the termination of the work. The French speaking and German speaking groups have been appointed and were to sail from Marseilles December 10. Dr. A. Lasnet, member of the Health Committee of the league and director general of public health in Algeria, heads the French speaking group which also includes Dr. Laigret, Dr. Dorolle, director of the municipal health service Hanoi, and Dr. le Van Chinh, Hanoi. In the German speaking group are Drs. Hermann Mooser, professor of bacteriology, Uni-

versity of Zurich, Switzerland; H. M. Jettmar, assistant professor of pathology, University of Vienna; Hans Winteler, formerly of Zurich and medical officer to a Himalayan expedition; and Mr. E. Etter, sanitary engineer, formerly of Zurich and recently on a mission to Persia. Dr. Robert Cecil Robertson, head of the division of pathologic sciences at the Henry Lester Institute of Medical Research, Shanghai, will be in charge of the English-speaking group, other members of which will be made known later, according to the announcement from the league.

Deaths in Other Countries

Dr. Erich Lexer, professor of surgery at the University of Munich, died December 5 in Munich, aged 70.

CORRECTIONS

Figures from Woman's Hospital—The following figures are submitted from Woman's Hospital, New York City, as corrections and additions to data regarding residencies published in the Educational Number of *THE JOURNAL*, Aug. 28, 1937, page 699.

Obstetric and gynecologic inpatients treated	3,406
Gynecologic deaths	26
Obstetric deaths	8
Stillborn viable babies	28
Neonatal deaths	36

Postgraduate Institute on Pneumonia—In Dr. J. G. M. Bullowa's discussion in the special article entitled "Postgraduate Institute on Pneumonia" in *THE JOURNAL*, Dec. 18, 1937, page 2058, about the middle of the second column, the sentence beginning "If a much more rapid flow, 80 liters a minute," should have read "8 liters per minute." Farther on in the same column the expression "alveolar air of a tent" should have read "alveolar air in a tent." Six lines from the end of this discussion the phrase "the hazard of fire from explosion" should be "hazard of fire from rapid combustion simulating explosion." On page 2062, first column, third paragraph, "Hooper" should be "Cooper." In the second column, fifth paragraph, on this page, add "with pneumococcus type II pneumonias" after the words "fifty-four patients." In the fourth line from the end of the seventh paragraph, "5 cc" should have been "0.5 cc." On page 2063, first column, third line from the end of the first paragraph the words "heart's load" should be substituted for the word "heat."

Government Services

Director of Cancer Research Appointed

Carl Voegtlin, Ph.D., chief of the division of pharmacology in the National Institute of Health, has been appointed director of cancer research under the new program recently launched by the U. S. Public Health Service. Dr. Voegtlin has for several years been conducting research in cancer at the institute. A native of Basle, Switzerland, Dr. Voegtlin received the degree of doctor of philosophy from the University of Freiburg in 1902. Early in his career he taught chemistry at the University of Wisconsin and pharmacology and medicine at Johns Hopkins University School of Medicine. He joined the staff of the Hygiene Institute, now called the National Institute of Health, U. S. Public Health Service, Washington, D. C., in 1913.

Examinations for Regular Army Medical Corps

The War Department announces an examination March 14-18 for the purpose of qualifying candidates for appointment as first lieutenants in the Medical Corps, Regular Army, to fill vacancies occurring during the fiscal year 1939. The examination is open to all male graduates of acceptable medical schools who have completed one year's internship in an approved hospital and who will not be over 32 years of age at the time. It will be possible to tender a commission. It will be conducted by boards of officers convened throughout the United States and will consist of a physical examination, a written examination in professional subjects and a determination of the candidates' adaptability to military service. Licentiates of the National Board of Medical Examiners may be exempted from the written professional examination. Full information and application blanks will be furnished on request addressed to the adjutant general, War Department, Washington, D. C. The final date for applications is February 20.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Dec 11, 1937

Medical Preparation for a National Emergency

The British Medical Association has been requested by the Committee of Imperial Defense to compile a register of physicians who would be available for national work in the event of an emergency, which is defined as "a situation necessitating general mobilization and embodiment of the territorial army." It is added that "if and when the time comes, the needs of the civil population will be fully borne in mind." No physician is being asked to enter into any obligation. What is sought is a statement of present intentions. Physicians will be given a yearly opportunity to review their intentions. The statement of intentions will be regarded as confidential unless and until an emergency arises. A circular letter has been sent out to the honorary secretaries of the divisions of the British Medical Association. It is hoped to be able to indicate to the authorities how many physicians have expressed their willingness to serve in particular capacities in the event of emergency. Information will be made available as to the proportion of physicians of different ages—a matter on which no accurate knowledge exists at present. A classification of physicians into the following categories is proposed: 1. Those willing to accept whole time service at home or abroad. 2. Those willing to accept part time service at home. 3. Those willing to offer emergency service for the medical care of civilian casualties after air raids or bombardments (a) in any part of the country to meet a local emergency or (b) in their own areas. The inquiry will be conducted with regard to all physicians whether members of the British Medical Association or not. It is suggested that this responsible task should be entrusted to a specially selected physician, preferably a retired or semiretired one. It will be his duty to approach all physicians in the area of the division of the association so as to obtain from them a completed form of inquiry. He will keep the register up to the minute and invite physicians once a year to state whether they desire to change the statement of their intentions.

Tomography

Tomography is a new method of radiography which consists in the "sectioning" of an organ by x-rays, so that by successive images it can be analyzed into slices and a synthesized reproduction given. The method was conceived by Bogaie in 1931 but has only recently been brought to practical realization. The x-ray tube and the film are coupled together by a pendulum or lever and moved during exposure in opposite directions. Objects within the body lying in the plane of the axis of rotation are sharply defined, while objects in other planes are blurred. Those nearest to the selected plane are least blurred, those furthest from it most blurred. By varying the extent of movement, one can investigate a plane of body tissue of any desired thickness. At the Section of Medicine of the Royal Society of Medicine, Dr. J. B. McDougall opened a discussion on the clinical value of the tomograph. He said that no department of medicine owed more to radiography than does diseases of the chest. The roentgenogram could convey more than any sign or group of signs. But the usual view, anteroposterior, lateral or oblique, left out much detail. In the interpretation of roentgenograms the superposition of the normal structures of the chest and of certain pathologic deposits introduced a difficulty. By tomography the different features of cases of pulmonary tuberculosis could be brought out. He had used the method for twenty-two months at Preston Hall (the village settlement for tuberculosis of the British

Legion, of which he is director). He demonstrated roentgenograms showing the successive appearances at increasing distances from the front of the chest and drew attention to the value in the elucidation of cavities. They gave clear information of the nature of the cavity wall, the tissues around it and the relation to the bronchial tree. Most important was the evidence of separate cavities in the lung unsuspected so long as ordinary roentgenography was used.

Dr. E. W. Twining, radiologist, said that this method offered fascinating possibilities. Not the least valuable was its stimulus to learn anatomy afresh in a three dimensional way. Malignant bronchial obstruction could be diagnosed without the use of iodized oil. The method was useful also in the differentiation between malignant neoplasm and chronic abscess. It gave a better chance of investigating the wall of a cavity and the septums than any other method. The components of the mediastinum could be sorted out in a way not possible by ordinary roentgenography. Tomography was useful in the roentgenography of the skull. The ordinary anteroposterior view was confused by many overlapping shadows, which tomography resolved. Particularly well shown was the mass of bone that filled the temporomandibular joint.

Traffic Accidents

In spite of all attempts by the government to reduce traffic accidents by regulations, their number remains appalling. In the House of Lords the bishop of Winchester asked the government what further steps they proposed to take in order to reduce accidents. He said that on an average twenty persons were killed and 600 injured daily on the roads. In ten years the number killed was 66,000 and the number injured 2,000,000. About 20 per cent of the casualties occurred in children under the age of 15 and every day two of these were killed. In the debate it was stated that 60 per cent of the traffic exceeded the speed limit. The speaker said that he had personally been driven at 40 and 50 miles an hour in controlled areas (a penal offense) by physicians, lawyers, merchants and ministers of the crown. There was on the market a device for the carburetor which made it impossible to travel more than 30 miles an hour. For the government the earl of Munster said that it was deeply concerned over the high rate of road accidents. The difficulty of the problem was shown by the fact that on the roads were 2,750,000 motor vehicles and 8,000,000 cyclists, as well as many millions of pedestrians. In the last three years the figures for road accidents had shown a welcome tendency to remain steadier, notwithstanding a large increase in the number of vehicles. Large sums were being spent on the improvement of the trunk roads. The government accepted a proposal to appoint a committee to consider what steps should be taken to reduce the number of casualties on the roads and a motion to this effect was passed.

Change of Policy of Medical Journal with Regard to Abstracting

A radical change is to be made in the *Epitome of Current Medical Literature* of the British Medical Journal, which has existed in its present form for forty-five years. At a meeting of the council, Dr. R. G. Gordon, chairman of the Journal Committee, referred to the inevitable disadvantages of the abstracting method as it had been followed in the *Epitome* for many years. What appeared to be desirable was not so much a sheaf of abstracts of doubtful value as a key to what other journals contained. It is proposed to replace the *Epitome* by an eight-page Key to Current Medical Literature—a sort of weekly *Index Medicus*. It is felt that this will be of great value not only to the specialist and consultant but also to the general practitioner who is inclined to specialize or the partner in a firm of practitioners who takes one subject as his province. It is proposed to have four pages devoted each week to the general journals, giving the titles of the articles in

English, with a short summary of not more than one or two of the more important articles in each particular issue. A second section of four pages will deal with special journals on similar lines and be divided into six categories in such a way that every one interested will know that once in a cycle of six weeks he will obtain a complete survey in the articles of his specialty. An incidental advantage will be that a large number of additional exchanges with other journals will be arranged.

In the discussion some skepticism was expressed as to the value of the proposal from the point of view of the general practitioner. To the specialist it was of value but he was provided for already. It was suggested that it would be better to give a summary from time to time of a group of papers on a particular subject. The proposal was carried by a large majority.

PARIS

(From Our Regular Correspondent)

Dec 11, 1937

Allergy Following BCG Vaccination

A paper on tuberculin allergy following parenteral BCG vaccination was read by Weill-Halle and Saye at the October 5 meeting of the Societe medicale des hopitaux de Paris. The clinical study of tuberculosis has shown the severity of extensive contagion in nonallergic individuals, especially during infancy and adolescence and among young adults. The mortality in cases in which segregation has not been possible has been from 2 to 3 per cent, whereas in those not so exposed to contagion the mortality has been minimal. It seemed desirable to ascertain whether the BCG when given by the parenteral route could allergize recently vaccinated persons, whether it could render allergic those who did not react to tuberculin and, finally, when the allergy was manifest.

A series of nurslings, isolated from all possible tuberculous contagion was studied. It was found that injection of the BCG vaccine, i. e., parenteral administration, produces allergy after intervals which vary according to the dose employed and some idiosyncrasies which it is impossible to foretell. Small doses, e. g., 0.04 mg., produce allergy in from seven to eight weeks, practically without nodule or abscess formation. Larger doses allergize in from three to four weeks and in a fourth of the cases are followed by abscess formation of mild character. If the intradermal method is used, the allergy takes place rapidly with minimal reactions. The existence of allergy is more easily ascertained by the intradermal method permitting positive reactions to be found, from one to three weeks before a positive epidermal reaction is evident. The appearance of the allergy is gradual, the reactions being doubtful or feebly positive and then quite marked in from one to three weeks. A period of from three to four weeks can be said to be the average of evidence of fixation of the BCG vaccine in the organism. If protection of the infant is desired up to the point of full development of the allergy, a delay of from two to three weeks should be allowed, after appearance of the first reaction.

Meningitis Cured by the Meningococcus Endoprotein of Reilly

A case was reported by Cattan and Fort at the October 22 meeting of the Societe medicale des hopitaux de Paris which aroused a great deal of discussion on the value in general of the serum treatment of cerebrospinal meningitis. The patient was a woman aged 39 who presented a typical meningitis syndrome and the meningococcus B was found by culture, in the spinal fluid. A total of 1285 cc of antimeningococcus serum was given subcutaneously and intraspinally. She was also given one injection of antistreptococcus serum (Vincent) because it had been reported by another laboratory that streptococci had been found in the spinal fluid at a later puncture. Blood cultures at a period when severe joint pains were com-

plained of were positive for meningococci. The condition of the patient appeared so desperate on the forty-fifth day that it was decided to give 0.5 cc of meningococcus endoprotein (Reilly) by the intramuscular route and 0.25 cc intraspinally. After a severe temperature reaction lasting two hours, a marked improvement was noted on the following day with a progressive recession of the meningeal symptoms. The authors stated that the failure of the antimeningococcus serum was in part due to the fact that the intraspinal method of injection was employed only after the fourth day and then, at first, only in irregular and weak doses. The serum was, however, given in large doses by the intramuscular and subcutaneous routes. Later, the serum given in large doses intraspinally did not seem to change the clinical picture.

In the discussion, Apert reported the case of a girl, aged 14 years, who appeared to be convalescent following antimeningococcus serum treatment when a series of chills every third day, accompanied by purpura, appeared, during which attacks the meningococcus was found in the blood cultures. Antimeningococcus serum was given but appeared to have no influence on the pseudomalarial attacks. After three injections of the Reilly meningococcus endoprotein, no further attacks were observed.

Lemierre stated that at the present time serotherapy alone did not suffice in the treatment of cerebrospinal meningitis because doubt exists as to the efficacy of the serum. There can be no question that it ought to be given immediately in every case but it often fails to cure, hence it should be discontinued if the symptoms are not seen to recede. If the serum acts it does so very rapidly, and, if it is noticed that there is no amelioration, no time should be lost in resorting to the endoprotein therapy, sulfamidamide or acriflavine. The first named had been successful in cases in which the serum had failed after being given for over a month. A single injection will often suffice, but it should never be given unless the patient has previously received the serum intraspinally.

Lesne said that it is difficult to form an opinion as to the value of the serum because the prognosis in children varies according to the age and according to seasons. If no improvement is noted after four or five injections, serotherapy can be considered as of no value in the specific case. Subcutaneous injection of serum can be continued but no further serum should be given intraspinally. Lesne had not seen any cures from endoprotein in children. In general, one has the impression that the antimeningococcus serotherapy is less efficacious at the present time and that the essential feature is the value of the lumbar puncture itself. Serotherapy should be given for several days but lumbar puncture alone is indicated as long as the fluid is purulent.

Marquezy had observed both cures and failures with serum treatment. If two or three injections have not been followed by cessation of symptoms, it is better to discontinue the serum. The endoprotein treatment ought not to be given from the onset. The patient ought to be given an intradermal endoprotein test, which must be positive, before the endoprotein treatment is begun.

Halle formerly believed that the serum treatment could be expected to be invariably successful, but he had encountered some cases that were resistant. The serum should be given a fair trial but, if it failed, endoprotein therapy was indicated.

Rist maintained that variations in the results of serum administration had been noted. During the World War he had observed some brilliant results, and if the serum was not effective in some cases it might be explained as due to a difference in the strain of meningococcus involved.

Jaussion was of the opinion that a mixed infection or variations in the virulence of certain strains of meningococci might explain the failure to respond to serum treatment.

Masary agreed with some of the previous speakers that there appeared to be a seasonal variation in the disease which

psychiatric research and therapy. Architecturally the pavilion system was utilized, there were twenty-five pavilions, each equipped with social rooms and theaters—in 1907 unheard of innovations for an insane asylum. New patients are classified as quiet, fairly quiet, or restless and assigned to a particular pavilion on the basis of this classification. Each new inmate first undergoes a detention period of from twenty-four to forty-eight hours in the observation ward before being assigned to the appropriate pavilion. In 1929 a new unit was opened at the Steinhof for the sole treatment of alcoholism. Many different methods of abolishing the drink habit are here utilized. A bureau for the supervision of alcoholic outpatients has also been established. It attempts to prevent retrogression of patients who have been discharged as cured and to expedite the readmission of recidivants. Occupational therapy is carried on in work shops, with which most of the pavilions are provided. Rug weaving, manufacture of dolls and gardening are among the occupations engaged in by the patients. The hospital's personnel includes beside the director (Professor Dr. Mauczka), twenty-five doctors, twenty clerical employees, 600 male and female nurses, dietitians, orderlies, ward maids and so on, eighty-one technicians, forty persons employed in the kitchen and fifty-five in the laundry.

Therapy of Thrombosis in Obstetric Cases

At the last session of the Gesellschaft der Aerzte, Dr. Friedlander of the Women's Hospital discussed the management of justly dreaded thrombotic conditions, which are especially apt to menace a patient toward the end of pregnancy and in which lurks the danger of embolism. The methods outlined by Dr. Friedlander are those regularly utilized in his service as well as in the clinic of internal medicine. Previously cesarean section had often been performed in dangerous cases as a means of avoiding the bodily movements and compression incident to labor. Friedlander, however, after careful experimentation with animals, decided that a thrombus may best be localized on the wall of the vein and untoward incidents forestalled by means of the following procedure. Instead of keeping the patient in a state of rest in bed, an intensive, systematic movement therapy is employed, the movements of the trunk and extremities bring an actively forming thrombus into intimate contact with the venous wall and a coalescence with the endothelium takes place, since the membrane is extremely sensitive to pressure. Accordingly, if a thrombus is detected in a gravid woman the initial step to be taken is negative: the patient is forbidden to lie in bed except during the regular sleeping hours. The pain that usually inclines the patient to seek her bed is best relieved by compression bandages. In this way the thrombus becomes fixated within a few days time and the woman can await confinement without anxiety. Patients who already enter the hospital as bedfast are furnished the compression bandage and then mobilized by systematic movement exercises. Dr. Friedlander presented women patients who had been admitted to his service suffering from acute thromboses in the pelvic vessels, the femoral vein and the vein of the lower leg. Yet following introduction of the new type of management these patients were, in a few weeks time, brought to normal delivery. Thus far he has seen nine such cases and twenty-five additional cases in which the patients became ill with acute thrombophlebitis "in puerperio." As a rule, from five to ten days of treatment is required before the free, uninhibited mobility of the patient is attained, in one case it took as long as three weeks. Nonobstetric cases (both gynecologic and internistic) in which thrombi appear run a similar course. Treatment usually lasts from five to fourteen days. Friedlander treated a total of eighty-four cases of thrombosis by his own method, in none of these did infarction take place. Naturally, in severe cardiac complications a therapy of movement should be introduced with the utmost caution or may be contraindicated. In the discussion Dr. Holler stated that

thirty patients (seven men, twenty-three women) in his own internistic service had received Friedlander's treatment, usually all these patients were seriously ill. Holler cited in particular the case of a woman, aged 46, who on admittance presented thrombosis in the pelvic vessels and infarct pneumonia. These conditions had proved refractive to all the older types of therapy and new emboli continued to form. Finally a course of movement therapy was decided on in spite of the patient's poor general condition and the cardiac myodegeneration. Treatment was begun while the patient remained in bed. Soon she was permitted to sit up in bed, then to sit up out of bed and later to walk about. In fourteen days she had become completely ambulant and was soon discharged as cured. Holler also reported the case of a woman, aged 78, who presented bilateral thrombosis in the deep femoral veins and who was quickly "mobilized" and discharged in three weeks completely cured. Dr. Knoflach has utilized "Friedlander's method of mobilization" in his own surgical service for the last eighteen months and almost completely foregone the conservative management. He stressed the advantages of the new therapy, notably the abbreviation of the period required for treatment, and the relative safety. Wherever the new method is followed, the "phlegmasia alba dolens" of earlier times is no longer seen. Mobilization induces improved pulmonary aeration and this in turn is a dominant factor in the abolishment or arrest of any existing inflammatory infarction.

Students Protest the Lengthening of Period of Study

Not long ago the Ministry of Education decreed that the revised medical curriculum should be instituted at an earlier date than that envisaged by the original plan. In particular it was decided to impose the requirement of the so called hospital year (namely, a compulsory unremunerated year's activity at a hospital prior to the award of the doctor's degree) during the current academic year instead of later. A large number of the student body protested vociferously against this new decision, which they regarded as an arbitrary and unforeseen prolongation of their period of training. Vienna University was the scene of so much unrest in this connection that classes were forced to suspend for several days. The less hot-headed elements among the student body were able, however, speedily to effect a compromise with the authorities. It was agreed that the new ordinance would first become effective in July 1938 and that only a six months hospital internship would be required of medical students who are now in their final year. It was also agreed that the members of this class would receive their doctoral degrees on completion of the regular academic curriculum and begin their hospital training as full-fledged physicians. The younger students, however, must complete a full year's hospital duty before receiving their final degrees.

Marriages

DANIEL GEORGE MELVIN, Greystone Park, N. J., to Miss Mary Catherine Donhee of Morristown, at Larchmont, N. Y., Oct 16, 1937

CHARLES S. PENNYPACKER, Ardmore, Pa., to Miss Margaret Harrison Colwell of Cynwyd, Nov 20, 1937

JOHN FRANCIS MCGUIRE JR., Washington, D. C., to Miss Rita Mary Connors in Miami, Fla., Sept 18, 1937

LEON F. HUTCHINS, San Angelo, Texas, to Miss Nan Mabel Lord of Nashville, Tenn., in November 1937

GLENN DEVERE CARLSON, Dallas, Texas, to Miss Lorraine Frances Manske of Sagerton, Dec 6, 1937

GEORGE W. BENNETT, Elsie Mich., to Miss Louise Wilbur of Greenbush Township, Nov 25, 1937

MILTON E. BITTER to Miss Alberta A. Kindred, both of Quincy, Ill., in November 1937

JOHN N. SNIDER, Chestnut Ridge, Pa., to Miss Helen Gans of Uniontown, Sept 3, 1937

Deaths

Elmer Ellsworth Hagler, Springfield, Ill., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1890, member of the Illinois State Medical Society and the American Academy of Ophthalmology and Oto-Laryngology, fellow of the American College of Surgeons, past president of the Sangamon County Medical Society, member of the advisory board during the World War, and district chairman of the National Council of Defense, at one time demonstrator of ophthalmic and aural surgery and clinical ophthalmology and otology at his alma mater, aged 74, on the staff of St. John's Hospital, where he died, Oct. 17, 1937.

Harvey Parker Towle ♂ Newton, Mass., Harvard University Medical School, Boston, 1892, member and past president of the American Dermatological Association and the New England Dermatological Society, at one time professor of dermatology at the Dartmouth Medical School, Hanover, N. H., instructor of dermatology at his alma mater and lecturer at the school of hygiene, Wellesley College, at various times on the staffs of the Boston City Hospital and the Massachusetts General Hospital, Boston, aged 70, died, Oct. 7, 1937, of cerebral hemorrhage.

Solomon Leon Cherry ♂ Clarksburg, W. Va., University of Maryland School of Medicine, Baltimore, 1908, fellow of the American College of Physicians and member of the American Society of Clinical Pathologists, past president and secretary of the Harrison County Medical Society, served during the World War, pathologist at St. Mary's Hospital, formerly bacteriologist to the city of Clarksburg health department, aged 50, died, Oct. 21, 1937.

J. Paul Ernest Bousquet, Montreal, Que., Canada, School of Medicine and Surgery of Montreal, Que., 1906, professor of clinical ophthalmology and otorhinolaryngology at his alma mater, member of the American Academy of Ophthalmology and Oto-Laryngology, fellow of the American College of Surgeons, chief of service, Hotel Dieu Hospital, aged 57, died suddenly, Oct. 27, 1937.

Stuart Avery Campbell ♂ Norfolk, Neb., Medical Department of Omaha University, Omaha, 1898, member of the Associated Anesthetists of the United States and Canada, fellow of the American College of Surgeons, past president of the Sioux Valley Medical Society, aged 63, died, Oct. 19, 1937, of heart disease.

George Williams, Independence, Mo., University Medical College of Kansas City, Mo., 1896, formerly superintendent of the Research Hospital, Kansas City, and the State Hospital, Blackfoot, Idaho, aged 78, died, Oct. 16, 1937, in the Independence Sanitarium and Hospital, of cerebral hemorrhage.

George Francis Adams, Kenosha, Wis., Hahnemann Medical College and Hospital, Chicago, 1888, member of the State Medical Society of Wisconsin, aged 74, on the staff of the Kenosha Hospital, where he died, Oct. 10, 1937, of injuries received in a fire which was started by a cigarette.

Heman Baker Chase, Westfield, Mass., Harvard University Medical School, Boston, 1908, member of the Massachusetts Medical Society, served during the World War, assistant superintendent of the Westfield State Sanatorium, aged 56, died, Oct. 11, 1937, of heart disease.

William Jeffries Cheurning, Fredericksburg, Va., University College of Medicine, Richmond, 1900, served during the World War, aged 60, died, Oct. 28, 1937, in the Walter Reed General Hospital, Washington, D. C., as a result of a stone impacted in the common bile duct.

Leonard E. Welch, Albany, Ga., University of Pennsylvania Department of Medicine, Philadelphia, 1893, member of the Medical Association of Georgia, formerly on the staff of the Phoebe Putney Memorial Hospital, aged 71, died, Oct. 3, 1937, of chronic infectious arthritis.

Silas James Alexander Hearne, Texas, Southwestern University Medical College, Dallas, 1909, member of the State Medical Association of Texas, member of the board of health and president of the board of education, aged 55, died, Oct. 31, 1937, of cirrhosis of the liver.

Thomas Joseph Burke, Elmira, N. Y., University of Buffalo School of Medicine, 1910, formerly on the staffs of the Arnot Ogden and St. Joseph's hospitals, Elmira, and the Tioga County General Hospital, Waverly, aged 51, died, Oct. 19, 1937, of carcinoma of the tongue.

Stella Mary Taylor, Boston, Woman's Medical College of Pennsylvania, Philadelphia, 1888, Trinity Medical College

Toronto, Ont., Canada, 1889, for many years superintendent of the New England Hospital for Women and Children, aged 80, died, Oct. 13, 1937.

Louis Napoleon Delorme, Montreal, Que., Canada, Laval University Medical Faculty, Montreal, 1886, professor of practical anatomy at the University of Montreal Faculty of Medicine, aged 75, on the staff of the Notre Dame Hospital, where he died, Oct. 3, 1937.

Federico D. Campos, Tacloban, Leyte, P. I., University of Santo Tomas College of Medicine and Surgery, Manila, 1932, member of the Philippine Islands Medical Association, formerly secretary of the Leyte Medical Association, aged 32, died Aug. 29, 1937.

Theodore C. McQuate, Massillon, Ohio, Toledo Medical College, 1902, member of the Ohio State Medical Association, for many years county coroner, aged 65, on the staff of the Aultman Hospital, Canton, where he died, Sept. 23, 1937, of cerebral thrombosis.

William Franklin Betts ♂ Evergreen, Ala., Tulane University of Louisiana Medical Department, New Orleans, 1892, secretary of the Conecuh County Medical Society, at one time city physician, county health officer and coroner, aged 66, died, Oct. 29, 1937.

George Herbert Williams, Haverford, Pa., L.R.C.P., Edinburgh, 1883, and M.R.C.S., England, 1884, Yale University School of Medicine, New Haven, Conn., 1891, aged 77, died, Oct. 6, 1937, in the Bryn Mawr (Pa.) Hospital, of cerebral hemorrhage.

Isaac W. Amerman, Nevada, Mo., University of Louisville (Ky.) Medical Department, 1880, member of the Missouri State Medical Association, owner of the Nevada Medical and Surgical Sanitarium, aged 86, died, Oct. 19, 1937, of coronary thrombosis.

De Witt Talmage Smith ♂ Dallas, Texas, Vanderbilt University School of Medicine, Nashville, Tenn., 1914, served during the World War, medical director of the Southwestern Life Insurance Company, aged 49, died, Oct. 2, 1937, of heart disease.

Charlotte Le Breton Johnson Baker, Point Loma, Calif., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1881, member of the California Medical Association, aged 82, died, Oct. 31, 1937, of nephritis and myocarditis.

John W. Werner, Newkirk, Okla., College of Physicians and Surgeons, Medical Department of Kansas City University, Kansas City, Kan., 1897, aged 74, died, Oct. 12, 1937, in a hospital in Chicago, of myocarditis and arteriosclerosis.

William Robertson Watson, Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1908, for many years on the staffs of the Episcopal and Pennsylvania hospitals, aged 67, died, Oct. 25, 1937, of heart disease.

Vincent Gaudiani, New York, Regia Università degli Studi di Roma, Facoltà di Medicina e Chirurgia, Italy, 1898, fellow of the American College of Surgeons on the staff of the Broad Street Hospital, aged 63, died, Oct. 8, 1937.

John Franklin Scribner, Sceptre, Sask., Canada, Queen's University Faculty of Medicine, Kingston, Ont., 1898, Manitoba Medical College, Winnipeg, Manit., 1911, aged 77, died, in October 1937, of bronchopneumonia.

Wellington B. Coffeen, Miami, Fla., Hahnemann Medical College and Hospital, Chicago, 1884, Chicago Homeopathic Medical College, 1884, aged 78, died, Oct. 17, 1937, in a local hospital, of injuries received in a fall.

Adam Stephan Rockafeld, West Lafayette, Ind., Jefferson Medical College of Philadelphia, 1869, aged 90, died, Oct. 22, 1937, in St. Elizabeth Hospital, as the result of an injury received in a fall from a tree.

Lester H. Botkin, Duquesne, Pa., Western Pennsylvania Medical College, Pittsburgh, 1888, member of the Medical Society of the State of Pennsylvania, aged 80, died, Oct. 16, 1937, of coronary occlusion.

Edward Davis Moffett, Berkeley, Calif., Central College of Physicians and Surgeons, Indianapolis, 1886, aged 75, died, Oct. 3, 1937, of chronic interstitial nephritis, arteriosclerosis and cerebral hemorrhage.

George Bertie Kennedy, Seabright, N. S. Canada, Western University Faculty of Medicine, London, Ont., 1901, served with the Canadian Army during the World War, aged 62, died, Sept. 9, 1937.

Walter May Blowers, Portland, Ore., Northwestern University Medical School, Chicago, 1905, aged 57, died, Oct. 25, 1937, in the Portland Sanitarium of hypertension, gastric ulcer and bronchopneumonia.

Traian Thomas Benchea, Wheeling, W Va, Indiana University School of Medicine, Indianapolis, 1934, aged 39, on the staff of the Wheeling Hospital, where he died, Oct 30, 1937, of bronchopneumonia

David Milton Cook, Craig, Colo, Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1901, aged 64, died, Oct 6, 1937, at the Solandt Memorial Hospital, Hayden, of coronary thrombosis

John I Chorlog, Madison Wis, University of Wisconsin Medical School, Madison, 1927, aged 34, died, Oct 18, 1937, in the Madison General Hospital, of an injury received in an automobile accident

Henry C Clark, Falmouth, Ky, Medical College of Ohio, Cincinnati, 1874, formerly county health officer member of the city council and mayor of Falmouth, aged 89, died, Oct 31, 1937, of pneumonia

James Archer Riley, Cleveland, Jefferson Medical College of Philadelphia, 1886, aged 75, died, Oct 6, 1937, in the Cleveland Clinic Hospital, of arteriosclerosis, heart disease and bronchopneumonia

William A Riegel, Catasauqua, Pa University of Pennsylvania Department of Medicine, Philadelphia 1889, member of the Medical Society of the State of Pennsylvania, aged 73, died, Oct 5, 1937

Charles Edwin Rich & Lynn, Mass Baltimore Medical College, 1902, on the staffs of the Lynn and Union hospitals, aged 62, died, Oct 2, 1937, of adenocarcinoma of the sigmoid

James Waite Vidal, Fargo, N D University of Michigan Homeopathic Medical School, Ann Arbor, 1882, aged 76, died, Oct 5, 1937, following an operation for removal of bladder stone

Hermon Wesley Small, Portland, Maine, University of Vermont College of Medicine, Burlington, 1890 member of the Maine Medical Association, aged 72, died, Oct 8, 1937

George Washington Bolckcom, Minneapolis, University of Minnesota College of Medicine and Surgery, Minneapolis, 1894, aged 70, died, Oct 17, 1937 of cerebral thrombosis

Robert Bunyan Ayer, Gainesville, Fla, Meharry Medical College, Nashville, Tenn, 1900, aged 71 died, Oct 29 1937, of injuries received in an automobile accident

Benjamin Lawrence Clayton, Pinson Ala Vanderbilt University School of Medicine, Nashville, Tenn, 1883, aged 79, died, Oct 23, 1937, of cerebral hemorrhage

Alexander James Rudolf, Milwaukee, Northwestern University Medical School, Chicago, 1901, served during the World War, aged 59, died, Oct 5, 1937

Francis Sherwin Allen, Philadelphia, University of the City of New York Medical Department, 1886, aged 81, died, Oct 15, 1937, of cardiovascular disease

Edward Moses Bell, Cohoes, N Y, Albany Medical College, 1893, health commissioner of Cohoes, aged 70, died, Oct 19, 1937, of chronic myocarditis

Alexander W Miller, New Waterford N S, Canada, Dalhousie University Faculty of Medicine, Halifax, 1905, aged 68, died, Sept 11, 1937

Ephrem Alphonse Marcoux, Fall River, Mass, Baltimore Medical College, 1904, aged 56, died, Oct 9, 1937, of pulmonary tuberculosis

Albert John Reynolds, Mount Forest, Ont, Canada, Victoria University Medical Department, Cobourg, 1889, died in October 1937

John Lewis Day, Westmount, Que, Canada, McGill University Faculty of Medicine, Montreal, 1895, aged 69, died, Sept 12, 1937

John Ulysses Day, Jacksonville, Ill, Barnes Medical College St Louis, 1908, aged 55, died, Oct 19, 1937, of dilatation of the heart

William Vilas Bryant, McFarland, Wis, Rush Medical College, Chicago, 1901, aged 61, died, Oct 31, 1937, of chronic myocarditis

Albert D Chattaway, Buffalo, New York Homeopathic Medical College, 1885, aged 74, died, Oct 23, 1937, of coronary thrombosis

Wilmot Collins, Erie, Pa, Western Pennsylvania Medical College, Pittsburgh, 1900, aged 77, died, Oct 14, 1937, of uremia

Margaret Ruth Otis & Los Angeles, Michigan College of Medicine and Surgery, Detroit 1905, aged 57, died, Sept 21, 1937

Richard Guy Tunison, New York Long Island College Hospital, Brooklyn, 1907, aged 57, died suddenly, Oct 10, 1937

Correspondence

THE METRAZOL CONTROVERSY

To the Editor:—In reply to, and as a companion communication to the one presented to THE JOURNAL Oct 30, 1934, page 1470, by Dr Joseph Wortis, the following points ought likewise to be presented to the medical profession

1 In answer to the question posited to him as to who originated the convulsive therapy of schizophrenia, Dr L. A. Meduna published the article "Die Bedeutung des epileptischen Anfalls in der Insulin- und Cardiazolbehandlung der Schizophrenie" (The Significance of the Convulsive Reaction During Insulin and Metrazol Therapy of Schizophrenia), *Psychiatrie Neurologische Wochenschrift* 39 331 (July 24) 1937 I had the pleasure of assisting in the translation of this article, which will appear in the *Journal of Nervous and Mental Disease* in a short time, and I quote here a few brief passages

"On the basis of the publications of Sakel, and later of Du. R. and Sakel, we conclude that

1 The insulin therapy evolved out of pure empiricism
2 The deliberate induction of the convulsive reaction is not the purpose of the insulin hypoglycemic therapy, inasmuch as there is no mention made of this in the above workers' publications, with the exception of the instance wherein an unsuccessful injection of camphor and cardiazol was given. From the case histories given they had no intention of provoking convulsive reactions. On the contrary, these occurred unexpectedly in four out of one hundred and four cases, and were regarded as dangerous complications
3 The great majority of patients who undergo insulin therapy successfully reach a complete remission without undergoing a single convulsive seizure. This is confirmed by a series of workers

"Muller (Insulin and Cardiazol Shock Therapies of Schizophrenia, *Fortschr d Neurol* 9 131 [April] 1937) states Sakel, Dussik and Sakel, Berglas and Susic, Kronfeld and Sternberg and others as well as I have reported a number of cases in which complete remission occurred either in phase I—before the onset of any type of hypoglycemic reaction, or when the treatment was interrupted in the pre coma stage—which must certainly be attributable to the therapy. Obviously in the four cases published in which convulsive reactions had occurred the association of the convulsive reactions with the ensuing remissions would not escape the attention of Sakel and Dussik. In the scope of the insulin therapy, however, nobody, as is evident from publications up to the present time has attempted to draw conclusions from this source and to work upon it systematically. Only May of the Munsingen Institute has found that in some cases the convulsive crisis exerted a definite beneficial effect. However, in just as many instances no therapeutic effect was observed. In the recent congress in Munsingen, Sakel practically endorsed these views as regards the convulsive reactions in the course of insulin therapy. The theoretical basis for the therapy with cardiazol lies in the assumption that a certain biochemical antagonism exists between the convulsive state and the schizophrenic process. It is effective only when a designated number of convulsive attacks can be provoked. It is merely implied that the insulin method is a result of an inductive train of thought, in contradistinction the cardiazol method is a deduction from a preconceived thesis.

The foregoing statement may be centrifugated to the following statement by Sakel (cited on page 10 of the monograph): "Of less frequent occurrence than the 'wet shock' is the definite somatic manifestation of a sudden severe convulsive seizure with tonic and clonic spasms tongue biting and a weak pulse—very dangerous, *caveat!* With the more and more widespread use of metrazol and the induction of convulsive reactions for the purpose of producing convulsions has been perfected and the use of the convulsive reaction as a therapeutic agent in schizophrenia is common knowledge—so much so that the 'dry shock' of the insulin procedure is now rather openly called an epileptiform crisis

2 If the issue of priority must be brought up for consideration, it might be well to note that in the field of mental disease

from time immemorial practically every physical and chemical means that has ever been used in general medicine has also been applied to the treatment of the mentally ill. Not long after insulin was introduced as a specific for diabetes, it was also employed empirically in the treatment of psychoses. Gyula Schuster, for example, used insulin in doses high enough to produce varying degrees of suspended consciousness up to the point of coma, wherein intravenous dextrose was necessary, and following this he noted improvements in the psychotic pictures. He would carry on this procedure for two or three months almost daily. In 1928 he reported sixty schizophrenic cases in which treatment was administered by this means, with considerable improvement in all of them (*Arch f Psychiat* 85 779, 1928). However, Schuster attributed these results to the "shocking" of the schizophrenic patient by producing severe physiologic alterations in the various organs, akin to anapylactic reactions. In the true sense of the word, this was not so vitally different from the original theorizations of Sakel.

3 There is no reason why any scientist in any country should seek to avoid a controversy about therapeutic means. From the practical point of view, almost every controversy in the history of medical science has ultimately brought out helpful and valuable increments. This forecasting of a "metrazol versus insulin" conflict should in reality be awaited expectantly because medicine will be benefited. Furthermore, more patients will receive treatment for the purpose of justifying a therapeutic precept. With regard to the last statement, it is common knowledge among physicians who work with insulin therapy that a great portion of their working day and a considerable amount of hospital personnel are occupied in properly carrying out the insulin procedure for a relatively small number of patients. The factor of simplicity is no mean attribute of the metrazol therapy. It is noteworthy in the latter procedure that a physician with the help of a nurse can administer at least twenty-five treatments in the early part of the morning and for the rest of the day may perform routine hospital duties, that the only apparatus necessary is the syringe and the gag, and the present day results of the two therapies are equivalent. It is furthermore to be noted that just as many insulin failures respond to metrazol as metrazol failures do to insulin. The feeling, or fear, that the metrazol therapy will supersede insulin therapy is justifiable since simpler and more economical procedures will naturally be used first.

The factors of simplicity and rapidity that go along with the metrazol therapy ought to meet with the approval of serious-minded, far-seeing psychiatrists who could use this added time for purposes of reeducation of the patient by means of occupational, milieu and psychologic therapies—an important consideration, indeed, from the standpoint of the final outcome of the psychosis.

As to whether the two treatment procedures are compatible or antagonistic, no one can tell with certainty as yet. This problem will no doubt be solved after perhaps years of research. It has been recently advocated that patients who do not respond rapidly enough or favorably enough to insulin ought also to receive metrazol in combinations of some type or another. I wish to refer again to a quotation from Meduna and to remark that workers ought at least to know what factors are at play in each type of therapy before combining the work in 'shotgun' fashion. It is urged that parallel case histories should be run to determine criteria whereby the individual case is better handled by one form of treatment or the other.

In closing it may be stated that I have discussed this point of view with a number of workers experienced in both fields. The consensus is that neither of these methods is a *sine qua non*—the finale of therapeutics is mental diseases. A great step has been made; controversy is helpful and instructive; much fruitful work is laid out for the future.

EMERICK FRIEDMAN, M.D., Stom. Lodge, Ossining, N.Y.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

PROPHYLAXIS OF MEASLES

To the Editor—There is now and has been for a few weeks an epidemic of measles in my community. Are the prophylactic preparations for measles generally accepted by the medical profession? The only one that I am familiar with is the one put up by Squibb and I have never used that.

J. W. LOWELL, M.D., Duvall, Wash.

ANSWER—Convalescent measles serum is a reliable prophylactic when given to susceptible children within three days of the date of exposure. The serum is administered intramuscularly in a single dose of from 5 to 15 cc. However, as this procedure confers only passive immunity, the protection lasts on an average only about ten days to three weeks, seldom longer.

Immune globulin, a human placental extract, is advocated by McKhann for the prevention or modification of measles. Lederle is among those who have this preparation on the market. For prevention, it is recommended that 2 cc of immune globulin, human, be injected intramuscularly at the earliest possible moment after exposure to measles, and that a second dose of 2 cc be given four days later.

Nevertheless, some clinicians believe that the value of immune globulin is uncertain for the purpose of prevention and that even if immediate protection does occur the immunity is very brief. The real worth of immune globulin presumably is its ability to modify measles and thereby lessen the danger of serious complications.

For modification of measles, immune globulin is injected intramuscularly in a dose of 2 cc from 'two to four days after the appearance of the rash in the exposing patient.' It is believed that this plan will usually modify the attack of measles in the exposed child without preventing it. It is evident that, if immune globulin will modify an attack of measles without danger to the patient, such a plan is preferable to temporary complete immunity, which can be conferred by other means. A modified attack of measles is almost certain to insure a permanent immunity.

It should not be forgotten that a patient with modified measles is capable of transmitting unmodified measles to susceptible contacts. For this reason the modification method is not suitable in hospitals where it is desired to prevent cross infections.

ALCOHOL AND CORONARY DISEASE

To the Editor—In a recent article published in *THE JOURNAL*, statements were made that people over 45 years of age who drank alcoholic beverages are less likely to develop coronary disease than total abstainers. Is this true? For one who drinks very little how much would it be advisable to drink? Is it apt to produce tremor? Are tuberculosis, syphilis, prostatitis, sluggish gallbladder and gastric hyperacidity contraindications to the use of liquor?

M.D., New York

ANSWER—There is probably only a grain of truth in the statement that persons over 45 who drink alcoholic beverages are less likely than total abstainers to develop coronary disease. That grain of truth concerns the amount. True chronic alcoholism does appear to protect the victim in some way, perhaps because the heavy drinker often does have his periods of fasting as far as food is concerned, and rich food inadequately earned by exercise is commonly the habit in the case of persons with presenile coronary disease. However, these heavy drinkers are prone to fall into the hands of the medical examiners or coroners because of accidental deaths or to have serious disease of the liver, nutrition or nervous system to shorten their lives, it is the medical examiners who report finding the coronary arteries of such persons soft.

The moderate drinker or one who drinks only occasionally or but little is apparently not protected. In a series of 750 cases of angina pectoris (based on coronary disease) analyzed by White and Sharber (*THE JOURNAL*, March 3, 1934, p. 655) the ratio of drinkers to total abstainers was 356:644. Only one person, the longest survivor, was a heavy drinker. In a control series of 750 subjects without angina pectoris but of the same age and sex, incidence and walks of life, the ratio of drinkers to total abstainers was 383:617. Gallavardin has

found angina pectoris to be common among the moderate wine drinkers of the Rhone valley

An entirely different aspect of the problem is the occasional beneficial therapeutic or prophylactic effect of rations of alcoholic beverages in cases of coronary disease with angina pectoris

Certainly it would seem unwise for any person with tuberculosis, syphilis, prostatitis, gallbladder disease or gastric disorders or, in fact, for any person healthy or diseased to drink enough alcohol theoretically to protect himself from coronary disease

AMENORRHEA AND HYPERTHYROIDISM— ENDOCRINE TREATMENT

To the Editor—A white woman aged 23 menstruated for the first time at the age of 12 years and for the following three years her menstrual periods were regular. At the age of 16 she first complained of symptoms which were interpreted as being due to hyperthyroidism and a thyroidectomy was performed within six months. Two months prior to the operation she abruptly ceased menstruating and at the same time generalized headaches usually of one day's duration began accompanied by dizziness and at times vomiting. These headaches were present in the morning but did not interfere with her sleep. There were no prodromal symptoms and no regularity of occurrence. The headaches occurred on an average of once a week after their onset and have changed in no respect in seven years and the patient has never menstruated during that time. She has now been married over a year during which time no contraceptive measures have been used. I have attempted to reestablish menstruation. From April 13 to 23 the patient was given 2,000 units of theelin daily. April 23 and every third day since she has received in addition to the 2,000 units of theelin 1 cc of gonadotropic substance from pregnancy urine (antuitrin S). To date there have been no indications of menstruation other than that April 20 she complained for one day of some tingling and fullness in the breasts. She has, however, had but one headache since the beginning of the regimen and this was unusually mild lasting less than three hours. I should like to know the probable cause of the amenorrhea and its relation to the headaches, the adequacy of my treatment to date, the length of time it should be continued and the probable prognosis as to reestablishment of menstruation.

MD, Iowa

ANSWER—The effect of hyperthyroidism on menstruation is not constant. In many cases the menses are normal, in others they are irregular, in still others there is an entire absence of the monthly flow, and in a few there is profuse bleeding. In Brams's series of 2,000 cases of hyperthyroidism there was a history of normal menstruation in 31 per cent, of delay or irregularity in 43 per cent, of amenorrhea in 24 per cent and of menorrhagia in 2 per cent (*M Times & Long Island M J* 62 10 [Jan] 1934).

The relation between the amenorrhea and the headaches is not clear. It is hardly likely that the absence of the menses is the cause of the headaches. More likely the amenorrhea and the headaches are due to the same cause.

Amenorrhea in the absence of disturbing symptoms does not call for treatment, especially because it is difficult to overcome. In many cases bleeding may be induced either by the administration of estrogenic substance alone or by the use of this substance followed by the corpus luteum factor (progesterin). However, nearly always such bleeding will recur only as long as one or both of these substances are administered. If only estrogenic substance is given, the bleeding is due to a proliferative type of endometrium. If both estrogenic and corpus luteum substances are given in sequence the flow may be associated with a secretory endometrium, but pregnancy will not be possible unless an ovum is present. Even though this patient has amenorrhea she may be ovulating. This can be determined by a study of the uterine endometrium at weekly intervals. Pieces of endometrium may readily be obtained in the physician's office without anesthesia by using one of a number of curets specially devised for this purpose.

The only value in bringing about bleeding in amenorrheic women by means of endocrine principles is a psychic one. If such women can be convinced that they are as healthy as women who do menstruate, there will be little need to treat them for amenorrhea. If bleeding is desired, this patient should be given 50,000 international units of estrogenic substance (theelin, ammotin) intramuscularly on the first, fourth, seventh, tenth and thirteenth days of a course and 15 international units of progesterin (proluton) intramuscularly on the seventeenth, eighteenth, nineteenth, twentieth and twenty-first days. If bleeding is to occur it will usually take place within ten days after the last injection of progesterin.

Gonadotropic substance from the urine of pregnant women (antuitrin-S, follutein antophysin) may be administered in place of progesterin but it is doubtful whether the results obtained are equivalent. One of the latter preparations may be injected intramuscularly in doses of from 150 to 200 rat units daily for five injections. To produce successive bleedings, these courses of treatment will nearly always have to be repeated.

RECURRING EPISTAXIS

To the Editor—A white man, aged 42, has for the past four years suffered from epistaxis from the right nostril, at monthly intervals lasting at each time about 500 cc. Rhinologists find during these attacks a spurting vessel on the septum which when cauterized ceases to bleed almost immediately. The next month however the patient bleeds from a different area on the septum but always on the right side. He states that when a child he had a tendency to frequent nose bleed. He has a sister who also bleeds from her nose at some monthly intervals throughout the year probably a trimester each year. He gives a history of chronic sinusitis (antrum) for the past ten years, with a history of sinus operations (drainage) of both sides some seven years ago. He also had gonorrhea about twenty years ago with no recurrences. He is married and has no children. He is well developed and nourished. His blood pressure is 130 systolic, 80 diastolic, and during one of the bleeding periods it was 110/80. Both antrums are cloudy and there is a definite mucopurulent drainage from the sinuses. Nasopharyngeal examination does not reveal any ulceration of the nasal passages. The oral cavity, neck, heart, lungs, abdomen and genitalia are entirely normal. The prostate is enlarged 2 plus, and massage reveals about 10 pus cells per low power field. Lymphocytes predominating and no organisms. The laboratory report (two weeks after the second nosebleed) was: hemoglobin 75 per cent, red blood cells 4,250,000, reticulocyte count 0.3 per cent, white blood cells 8,000, polymorphonuclears 68 per cent, lymphocytes 17 per cent, myelocytes 1 per cent, eosinophils 4 per cent, nuclear index 64, sedimentation rate 1.6 cm in one hour, blood phosphorus 2.6 m, blood calcium 10 mg, blood Kahn and Kolmer reactions negative, stool examination negative for parasites, blood cholesterol 150 mg, blood urea nitrogen 18, blood sugar (fasting) 100 mg, urine normal, bleeding time one minute, prothrombin time five and one half minutes, capillary fragility test essentially normal. Iron therapy was used and there were pre-operative massage and diathermy to the prostate. Although my belief is that the cause lies entirely within the nasal cavity and is not a blood dyscrasia, I have suggested to the patient that theelin or some ovarian preparation should be tried, especially because of the monthly recurrences. What further diagnostic procedures would you suggest? What treatment? The patient does not pick or traumatize his nose in any way.

MD, Florida.

ANSWER—Since there is nothing in the history or examination of the blood to suggest a blood dyscrasia and since no lesions are visible in the nasal cavity proper, it is important next to exclude the possibility of a malignant growth in the chronically infected antrum. This sinus should be filled with some contrast medium and roentgenograms taken. Should these disclose disease involving either the mucous lining or the bony walls, the next step would be a Caldwell-Luc operation. If the roentgenograms prove negative, one must then be sure that there is no lesion in the nasopharynx. Carcinoma is not so infrequent in this location and may be responsible for recurring hemorrhages, although these as a rule are likely to come at irregular periods. In the absence of any of these possibilities, one is forced to treat the condition empirically. The best method is with radium. A 25 mg capsule protected by rubber tubing is placed in each nasal chamber, held in place with packing and left there for three hours. This yields a total of 150 mg hours for the two sides. A slight reaction in the form of redness and swelling may follow for two or three weeks and the application can be repeated within four to six weeks.

OCCUPATIONAL DISEASE IN PHOTOGRAPHER

To the Editor—A professional photographer aged 50 for the past four months has noted dizziness, weakness, loss of hearing in one ear and loss of smell, which has become progressively worse. He has lost 20 pounds (9 kg). The red blood cell count is 5,200,000, hemoglobin is 85 per cent. Wassermann reactions are negative, the reflexes are all normal. Can any chemical or chemicals with which the photographer comes in contact cause an intoxication to explain these symptoms? If so, what are the antidotes?

LEONARD J. RABHAN, MD, Savannah, Ga.

ANSWER—The photographic art is so highly individualistic that scarcely any two large establishments make use of precisely the same chemicals in their practices. Among the commonly used substances are methyl para-aminophenol sulfate, para-amidophenol hydrochloride, diamidophenol sulfate, potassium dichromate and quinone-chlorodiamine, together with many common acids, sodium thiosulfate, silver nitrate, borax, ferricyanides and potassium bromide. The majority of these substances are well known as causes of dermatitis and the photographic trade may be characterized as one in which dermatoses arise with great frequency. None of these substances are known to be capable of producing the systemic disturbances described in the query. If it may be assumed that this clinical condition is the result of work exposures, suspicion may be directed to the mounting cements. At the present time large numbers of photographers use rubber cement, which frequently contains benzene, for mounting prints. Working in a confined space, exposure to evaporated benzene, connected with the frequent mounting of batches of pictures, is sufficient to produce benzene poisoning. The clinical picture described is not entirely characteristic of benzene poisoning, but the "dizziness, weakness, loss of

of weight and malaise" are all suggestive. The following steps should be undertaken in this connection:

- (a) Investigation of the nature of mounting cements
- (b) The making of differential blood counts—a leukopenia being highly suggestive of benzene poisoning
- (c) The making of the urine sulfate test as described by Yant, Schrenk, Sayers, Horvath and Reinhart in the *Journal of Industrial Hygiene and Toxicology* 18:69 (Jan.) 1937

ENDEMIC GOITER IN PREGNANCY

To the Editor—A white woman aged 31, active, intelligent and in good health, recently married, desires to become pregnant. Born and educated in the Middle West, she has an endemic goiter; it is not large or disfiguring and does not produce symptoms. The fullness of the thyroid, however, is much more prominent during the menstrual period. The patient is 5 feet 4 inches tall (163 cm) and weighs 128 pounds (58 kg). The pulse is 76 and the blood pressure 114 systolic, 60 diastolic. The patient's mother also had thyroid enlargement which disappeared after pregnancy. In the event of pregnancy, should the patient receive any thyroid or iodine therapy? If so, what and how much? Is there any danger of the thyroid becoming larger or of a thyroid cretin offspring? Any information and advice as to the proper management of this patient before, during and after pregnancy will be greatly appreciated.

M D New Jersey

ANSWER—The diffuse enlargement of the thyroid, which is endemic in the Great Lakes region and is not productive of symptoms, is unlikely to give rise to pathologic changes during pregnancy. It would be advisable to have a determination of the basal metabolism. If this is normal, the patient can use iodized salt during her pregnancy unless salt is contraindicated because of a developing toxemia of pregnancy. Small doses of iodine in the form of compound solution of iodine, one drop daily, can be given in place of the iodized salt. It has been found that minute doses of iodine during pregnancy provide a sufficient safeguard against the development of undesirable symptoms. There is little likelihood of a cretin offspring in the patient described, and if the basal metabolism is within normal limits the small amounts of iodine will provide additional protection in this regard. The management following pregnancy need not differ from that during pregnancy. The basal metabolic test can be repeated three months post partum as an added precaution.

MARIHUANA OR CANNABIS

To the Editor—There is considerable interest in my community regarding the prevalence of the use of marihuana or cannabis. I would appreciate it if you could supply me with some information concerning its general consumption, how it is prepared and the rapidity with which its use is being increased in this country. Any additional information concerning its growth and preparation for bootleg consumption will be greatly appreciated.

A B BOWYER, M D, Buckhannon, W. Va.

ANSWER—Up to within the last decade, the use of marihuana was confined largely to the states bordering on Mexico and to communities farther north having a large Mexican immigrant population. Within the last few years its use has spread to nearly all parts of the United States, and especially the eastern half. It is a weed and is grown easily. Patches have been found under cultivation in many communities, both in small towns and in cities, and even in prison yards. Large quantities have been destroyed by federal agents. The leaves are merely dried and the drug is then ready for smoking. There have been conflicting reports as to the deleterious action of marihuana on the human system when smoked. The majority opinion is that it is habit forming and is responsible for its users running amuck.

Information relative to the growth, preparation for marketing, sources of supply and consumption of marihuana or cannabis can be obtained by consulting the following literature:

McCormack, George Randall. *Marihuana Hygiene* 15:898 (Oct.) 1937.

Hearings before the Committee on Ways and Means, House of Representatives, Seventy-Fifth Congress, first session, April 27-30 and May 4, 1937, on H. R. 6385. A Bill to impose an occupational excise tax upon certain dealers in marihuana and to impose a transfer tax upon certain dealings in marihuana and to safeguard the revenue therefrom by registry and recording. United States Government Printing Office, Washington, D. C.

Anslinger, H. J. *Traffic in Opium and Other Dangerous Drugs for the Year Ended December 31, 1935*. U. S. Treasury Department, Bureau of Narcotics, U. S. Government Printing Office, Washington, 1936. pages 30, 34, 39, 40 and 63.

The following articles relating to the federal regulation of marihuana or cannabis were published in *THE JOURNAL* during the year 1937:

Federal Regulation of Medicinal Use of Cannabis. Editorial. *THE JOURNAL*, May 1, 1937, p. 1543.

United States Assumes Control of Cannabis. *ibid.* September 11, p. 31 B.

Federal Cannabis Regulations Approved. *ibid.* October 16, p. C31.

POSSIBLE CRIMINAL ABORTION

To the Editor—A short time ago my colleague and I performed a necropsy on the body of a woman aged 34 at the request of a coroner's jury in an effort to determine the cause of death. It was done some twelve hours after death and the body was in rather a foul condition. The following are the salient facts. The history of the case scanty, though it was led one to believe that the cause of death would be found in the abdomen and this proved to be true. There was (1) a generalized peritonitis, (2) a large amount of hemorrhage in and around the pelvic organs and (3) a 1½ inch ragged hole in the fundus of the uterus. The uterus was slightly enlarged and boggy but contained no products of conception. Both tubes and ovaries were normal. On the basis of these observations we reported the cause of death as (1) hemorrhage, (2) peritonitis and (3) rupture of the uterus, probably the result of an attempt to do an abortion by instruments in the hands of some unknown person or persons. As stated the clinical history and course of the case is meager. My colleague saw the patient once before death but was not able to obtain a clear and adequate history. It is stated, however, by some of those who attended the patient that she miscarried some time before death ensued. No one can say whether this was a blood clot or whether it really was a fetus passed. I realize that the information given here is wholly inadequate but if you can help us with the following questions we shall be deeply grateful. Do you think our diagnosis as to the cause of death reasonable? I might add here that the husband, whose character and reputation are reported as being questionable, is being held for the alleged crime. Could there be any other assignable cause for the hole found in the fundus of the uterus? If so, will you please give references so that I may read of the cases? A great deal has been said in the court where this case is now being tried over the probability of the patient herself having punctured the uterus in an attempt to do an abortion. Do you think this likely? Are there any cases of a similar nature reported in the literature? As you can see the entire case is rather vague except for the fact that the uterus was found to be perforated at the fundus.

M D

ANSWER—The conclusion that death resulted from rupture of the uterus, hemorrhage and peritonitis seems warranted by the results of the necropsy even though nothing is said about organs and parts other than the pelvis and the peritoneum. "A 1½ inch ragged hole in the fundus of the uterus," which was "slightly enlarged and boggy," certainly suggests perforation in the course of efforts to evacuate the pregnant uterus, but obviously other possibilities, however remote they may seem, cannot be excluded definitely in the absence of positive signs of pregnancy. It is noteworthy that the question does not tell whether the patient was a multipara or a possible primipara or whether the physician who saw her "once before death" made any pelvic or other examinations. And the account of the necropsy is silent as to the breasts, as to signs of infection in the uterus, as to a possible placental site, as to the condition of the uterine cervix—did it show marks of having been grasped by tenaculum or other means?—and as to the vagina and perineum. Abortion may be attempted on a nonpregnant woman who is assumed to be pregnant, and death has resulted from such attempts. Efforts at self-induced abortion are not uncommon and may include insertion into the vagina of darning needles, umbrella ribs or sounds, penetration into the abdominal cavity, usually through the vagina, and death may result. In cases possibly of this nature the question must be considered whether the injuries found could have been caused by the woman herself.

CLIMATE AND SCHOOLS FOR RHEUMATIC FEVER

To the Editor—Please send me information regarding schools for children who are convalescing from rheumatic fever. What climate seems to be the most favorable? I am particularly interested in schools located in Florida.

GEORGE I. COELSTEIN, M D, Brooklyn

ANSWER—There are no schools established especially to care for children convalescing from rheumatic fever. In various large cities, particularly in the northern latitudes, there are numerous institutions usually convalescent homes, where the rheumatic fever subject receives schooling as a part of his institutional care. In some of these large cities it is possible to place the rheumatic child in special classes in public schools. In the state of Florida there is no school which specializes in convalescent rheumatic fever children. The Out-of-Door School of Sarasota, Fla., has come nearer to this than any other known school, having a supervising nurse who has had several years' experience in one of the good rheumatic fever clinics in the North.

It is impossible to state, with any degree of certainty, what climate would be most favorable. The geographic distribution of rheumatic fever is not well known. Of interest is the recent interesting study of Paul and Dixon (*THE JOURNAL*, June 19, 1937, p. 2096) and the report of Nichol (*J. Lab. & Clin. Med.* 21:588 [March] 1936). Transportation of rheumatic fever subjects to a tropical or subtropical climate involves many difficult problems and is not to be entered on lightly. The successful

transposition of eleven patients to Puerto Rico by Dr A F Coburn is related in his monograph "The Factor of Infection in the Rheumatic State," Baltimore Williams & Wilkins Company, 1931. A short summary and discussion of the transposition of children to southern Florida appear in the proceedings of the American Rheumatism Association (THE JOURNAL, Oct 16, 1937, p 1307). From this report it is evident that such transposition is not a panacea. Southern Florida, Arizona and California have been about equally popular as a climate of choice and any advantage of one over the other is unknown.

ROOT RESORPTION FOLLOWING ORTHODONTIC TREATMENT

To the Editor—A man aged 24 well proportioned weighing 165 pounds (75 kg) and 5 feet 10 inches (178 cm) in height has been informed that he will lose his teeth in a few years. He has had orthodontic treatment for a period of four years under the care of an eminent and capable orthodontist. A ray examination of the teeth prior to treatment revealed normal roots and excellent condition of all his teeth. Traumatic occlusion was present previously and is present now. Cosmetically however the result is good. The general physical and mental status of the young man is excellent. He eats a well balanced diet of fresh foods, vitamins and minerals. A ray examination of his teeth after orthodontic treatment reveals absorption of the roots which condition was not present four years ago when it was instituted. On this basis an eminent pharmacologist and physician prophesied that he would lose his teeth in a few years. Retainers on the teeth seem to be contraindicated. Apparently the traumatic occlusion which is still present indicates a bad prognosis. Your opinion is desired as to etiology and treatment.

CARL DAVIS, M.D., Bay Side, L. I.

ANSWER—A reasonably satisfactory answer to this question could be made only after an examination of the patient and a careful study of accurate casts of the mouth and roentgenograms. In their absence however, some general statements can be made. First, traumatic occlusion is an indefinite and controversial concept. It cannot be determined by an analysis of mechanical conditions alone. It is a ratio or relation between mechanical conditions and the ability of the tissue to sustain them. It may be called a mechanical tolerance, somewhat comparable to the sugar tolerance of an individual. In the consideration of traumatic occlusion too often the mechanical conditions alone have been considered. To predict, therefore, what will happen to a denture simply by an analysis of the mechanical conditions is not wise.

Resorption of the roots of teeth has undoubtedly been produced by orthodontic movement, but no satisfactory correlation has ever been established between resorption and methods of treatment. From the observation of cases in which root resorption has occurred in orthodontic treatment it would seem justifiable to say that the resorption is usually not progressive after the completion of treatment and usually does not affect the functional efficiency of the denture.

The work of Dr Herman Becks of the University of California has apparently established the relation between hypoparathyroidism and root resorption. He has shown that root resorption occurs in many hypoparathyroid patients who have had no orthodontic treatment or other mechanical stimulus.

To predict the loss of the patient's teeth in the near future on the basis of root resorption or traumatic occlusion does not seem justified.

REGIONAL ILEITIS

To the Editor—A diagnosis of regional ileitis and ulcerative colitis of the ascending colon was made on a patient about five months ago. The condition is about two years old. Clinically the patient seems fairly well and has one or two well formed stools daily, no blood, little mucus and no fever. His weight has remained rather stationary, his appetite is poor. Resection of the diseased ileum and colon has been advised but he is averse to having that done because of his comparatively good condition. What would you advise? If resection is advised what are the mortality rates and prognosis for cure?

M.D., New York

ANSWER—The subject of regional ileitis and regional ulcerative colitis has come to the fore in recent years. There exists an ulcerative ileocolitis in which isolated parts of the intestine are involved. Apparently, it may affect any segment of the small or large intestine. Occasionally, multiple segments have been involved. The condition has been found limited to small portions of the jejunum, ileum and large intestine. In some respects it simulates the so-called bacterial type of chronic ulcerative colitis known frequently as colitis gravis. No particular type of bacteria has been found frequently enough in these cases to give assurance regarding its etiology.

To date the treatment of choice seems to be surgical resection. Its indication will depend on the extent and severity of involvement. It is best undertaken when the patient's condition is good for the tendency of the condition is to progress so

that larger and larger segments of bowel ultimately are involved. The end results of surgical excision are good. Recurrence, after resection have occurred but they are relatively uncommon. In the main, it can be said that the ultimate prognosis for cure by complete eradication of the disease is good. It would be difficult to quote the mortality statistics because they vary considerably in the hands of different surgeons. In the main, the associated surgical risk has been comparatively low.

MERALGIA PARESTHETICA

To the Editor—A white man aged 36 complains of numbness on the anterior surface of the left thigh. The onset occurred two years ago, when slight burning sensations were noted in the left thigh on long sitting or standing. The sensations were infrequent and transitory. Now the sensation is that of dead weight and is present almost continuously. Last month he sprained his back and it was strapped. The strapping, done in the usual way, aggravated the sensations of numbness and had to be removed. Examination of the patient is negative except for the left thigh. The area involved is on the anterior surface, beginning 2½ inches below the groin and extending to the kneecap. It covers partly the distribution of the lateral femoral cutaneous nerve and partly that of the anterior femoral cutaneous nerve. In any case the spinal origin is lumbar 2-3. Here there is diminished (not absent) sensitivity to light touch, pin prick pressure and hot and cold. The skin shows no atrophy. There is no motor disturbance. The reflexes are normal. The blood and the urine are normal. There is a history of chronic pyelitis but there are no signs at present. A ray examination of the lumbar vertebrae gave negative results. The left hip showed normal bony outlines and no rarefactions but some joint mice in the cavity. No other pathological changes were noted. Since the patient has no complaints or physical abnormalities referable to the left hip, what importance do you attach to the joint mice in relation to the nerve symptoms? What would you suggest as to the possible cause of these symptoms and method of treatment?

M.D., New York

ANSWER—The condition is probably meralgia paraesthetica as described by V K Roth (*Med. Obstr.* 43: 678, 1895) and Martin Bernhardt (*Neurol. Centralbl.* 14: 242, 1895). Independently J H Musser and Joseph Sailer (*J. Nerv. & Ment. Dis.* 27: 16, 1900) collected reports of 100 cases in 1900, and H I Goldstein (*Am. J. M. Sc.* 162: 720 [Nov.] 1921) found 135 cases in the literature up to 1920. Osler gives a good account of the disease in his textbook. H R Viets (*Boston M. & S. J.* 191: 497 [Sept. 11] 1924) reported two cases. The disease is usually limited to the external cutaneous nerve although the anterior crural nerve may be involved, as it often overlaps the other. About 75 per cent of the cases are in men and are due to trauma or pressure from orthopedic belts or strapping. Pregnancy is a common cause in women. Treatment consists of alcohol injection or excision of the nerve. The condition should be distinguished from the pain caused by spinal cord tumor or tabes dorsalis.

INGUINAL LYMPHADENITIS OR VENEREAL LYMPHOGRANULOMA

To the Editor—A man aged 34 for the past two months has had a chronic suppurative lymphadenitis of the left inguinal region. About March 25, 1937, he slipped on an icy pavement experiencing a sharp pain in the left groin. The pain increased in severity during the next few days. March 31 I could discover nothing except a small superficial lymph gland in the inguinal region which was rather tender to touch. There was no visible skin injury in the neighboring thigh region or genitals. There was no history of gonorrhea, the blood Kahn reaction was negative and the Frei test was negative. After several days of treatment in bed a soft mass finally formed which I opened. A deal of pus was removed and the wound has been draining since. A smear showed only pus cells with no bacteria. Can such a condition arise from trauma alone without the necessity of a lymphatic invasion by bacteria from a regional skin wound? Is it possible that a lymph gland may have been infected years ago, remained quiescent and then flared up as a result of the trauma? I would appreciate any reference to the literature.

EDWARD J. STEINER, M.D., Chicago

ANSWER—One would be suspicious in this case of venereal lymphogranuloma despite a negative Frei test. It might be wise to give one ampule of Frei antigen (Lederle) intradermally once a week for five or six weeks to see whether or not improvement would take place. One cannot exclude trauma as a factor in the etiology of this abscess although organisms must have been present in the lymph node or in the neighboring soft parts, skin or subadjacent tissues.

References

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SENSITIVITY TO CASSAVA—JERUSALEM
ARTICHOKE

To the Editor—Can you give me some information on the following points 1 Does sensitivity occur to tapioca arrowroot? There seems to be a difference of opinion on this point 2 Where can artichoke flour (made from the Jerusalem artichoke) be obtained? Does it have other substances mixed with it? 3 Of what is cassava cake (made by Arnaud Incorporated Detroit) made? These products would be of great help in planning diets for patients sensitive to all the common cereals if adequate information about them can be obtained

M D Illinois

ANSWER—1 and 3 "Cassava cake" is imported from South America (Arnaud, Incorporated 24 West Statefair Road, Detroit) It is a wafer made of finely ground cassava, a minute quantity of salt, and water Both arrowroot and tapioca are obtained from this same plant Cassava is a farinaceous root of two plants of the spurge family, the bitter cassava and the sweet cassava Both are natives of South America Bitter cassava is more important commercially and has been introduced into most tropical countries No report has been found in the literature regarding tapioca and arrowroot sensitivity though there is apparently no reason why this might not occur Cassava is of importance in planning the diet for allergic patients, as it is high in carbohydrates (69.5 per cent) and its caloric value (33 calories per gram) is likewise high

2 Artichoke flour has been made by the Pabst Brewing Company for several years The stock and methods for producing this are now in the hands of Anthony A DeBole, American Artichoke Products, 178 Prince Street, New York He states that he manufactures this at present for commercial experiments only and has only 5000 pounds of it on hand

LEADING CAUSES OF DEATH

To the Editor—What are the ten most important causes of death in the United States?

F EARLE MAGEE MD Oil City Pa

ANSWER—The mortality in 1933, according to Britten (*Pub Health Rep* 51 1 [July 17] 1936), is based on the crude annual death rate per hundred thousand, is as follows

Diseases of the heart	228.0
Cancer and other malignant tumors	102.2
Influenza and pneumonia	95.6
Nephritis and other kidney diseases	85.7
Cerebral hemorrhage	84.0
Tuberculosis	59.5
Diseases of early infancy	50.6
Automobile accidents	24.7
Diabetes mellitus	21.3
Diarrhea and enteritis	17.2

For the industrial policyholders of the Metropolitan Life Insurance Company for the year 1934 (Armstrong Competitive Plagues of Mankind, *Better Health* August 1935) the seven leading causes of death per hundred thousand were listed as

Heart disease	162.7
Cancer	97.0
Pneumonia	65.0
Chronic nephritis	64.8
Cerebral hemorrhage	63.2
Tuberculosis	59.3
Accidents (all forms)	57.8

For further details on this subject the annual compilations of the Bureau of the Census, called Mortality Statistics should be consulted

DILATION OF ANUS IN BABIES

To the Editor—What are the indications for stretching the anus of young babies and the method employed

M D Pa

ANSWER—Strictures of the rectum in young babies may necessitate stretching of the anus Strictures of the lower part of the rectum or anus may be due to embryologic malformations of the rectum and anus These include (1) narrowing of the anorectal region without complete occlusion, (2) complete occlusion of the anus by a single membranous diaphragm (3) absence of the anus with the rectum ending in a cul-de-sac, and (4) a normal external anus ending in a cul-de-sac, and the rectum ending at a varying distance above

Strictures of the lower part of the rectum may be the result of inflammatory lesions, such as gonorrhea or the scar tissue from a fistula in ano Strictures may be due also to sacral tumors, such as dermoid cysts or to intra-abdominal tumors, such as cysts of the kidneys Accidental injury with resulting scar tissue may be cited as another cause or stricture following the opening of an imperforate anus may result from scar

tissue Syphilis of the rectum is said occasionally to cause stricture Hemorrhoids are rare in children and probably are never the cause of stricture

In case of imperforate anus, the diagnosis must be made early and, if there is but a thin membrane, this may be easily cut or punctured and dilated to a sufficient degree to permit a free passage of meconium

When the anus is absent, a more complicated surgical procedure is necessary When there is stricture due to other causes, dilation may be attempted with the finger of the physician or rectal dilators may be resorted to It must be remembered that the tissues of a young infant should always be treated with respect, and forcible dilation by any method should be avoided

MOLDS OF INJURED FACES

To the Editor—Where can I get material and instructions for making molds of injured faces?

A L DELANEY MD Liberty Texas

ANSWER—There are a number of ways of doing this A fine grade of plaster of paris can be applied directly to the face to get a negative and then filled with either plaster of paris or gelatin If one is not familiar with the use of plaster of paris, a dental surgeon would be helpful Negocoll is one of the preparations used for this purpose, it is carried by dental supply houses Dr E H Golden, University Club Building, St Louis, makes impressions by spraying wax on the face

X-RAY AND SHORT WAVE THERAPY FOR
NASAL POLYPS

To the Editor—Can you give me any information regarding the use of the x-ray and short wave combination for nasal polyps? A patient has been advised to have such treatment Does it offer a good hope?

LOUIS L SHERMAN MD Oakland Calif

ANSWER—As far as short wave therapy is concerned, it can have no effect other than that which heat would produce, and there is nothing to indicate that heat is a particularly favorable therapeutic measure for nasal polyps Some favorable results have been reported after radiation therapy As only a small number of men have reported in the literature on the use of x-rays and radium, and, further, as by far the larger number of reputable men in the profession both here and abroad do not use x-rays or radium consistently or regularly for the treatment of polyps it must be said that, while there can be no great objection to the use of radiation therapy, conservative and older measures are still the procedures of choice

TREATMENT OF SEASICKNESS

To the Editor—What is the most satisfactory treatment for seasickness both prophylactic and active

M D California

ANSWER—Not only is there no specific treatment for seasickness but there is no generally applicable satisfactory treatment For the average traveler, who under average conditions adjusts himself within a short time to life on shipboard, the best course to follow is usually to take no drugs and to remain quiescent as long as nausea persists, awaiting the generally favorable outcome For the person whose previous experience leads him to expect severe and persistent symptoms, or for a short but stormy passage, a judicious use of sedatives, for both prophylaxis and treatment is often recommended The barbiturates, especially phenobarbital taken together with belladonna may prove beneficial It must be emphasized, however that indiscriminate use of sedatives may result in prolonging the indisposition even beyond the period of the voyage itself

TITANIUM OXALATE IN ARTERIOSCLEROSIS

To the Editor—Can you inform me whether titanium oxalate is of any value in arteriosclerotic disease? None of my books mention this substance C W Kjelgaard in the April *Medical World* writes rather enthusiastically about it but I wonder whether it is just another drug

F H GILE MD Prantree Mass

ANSWER—The *Quarterly Circulation Index Medicus* gives no reference to the use of titanium oxalate in arteriosclerotic disease Some work has been done in France on the titanium content of tissues particularly of lung tissue in connection with pneumoconiosis The work of Kjelgaard probably reports the first attempt to apply this rare element in therapy and skepticism is justified until further data are available Certainly the internal use of an oxalate salt is precarious

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA Montgomery June 28 Sec Dr J N Baker 519 Dexter Ave Montgomery

ALASKA Juneau March 1 Sec, Dr W W Council Box 561 Juneau

CALIFORNIA Reciprocity San Francisco Jan 5 Los Angeles Feb 23, San Francisco May 11 Los Angeles July 11 San Francisco Sept 14 and Los Angeles Nov 16 Written examinations Los Angeles March 7 10, San Francisco June 27 30 Los Angeles July 11 14 and Sacramento Oct 17 20 Sec Dr Charles B Pinkham 420 State Office Bldg Sacramento

CONNECTICUT Basic Science New Haven Feb 12 Prerequisite to license examination Address State Board of Healing Arts 1895 Yale Station New Haven Medical (Regular) Hartford March 8 9 Endorsement Hartford March 22 Sec Dr Thomas P Murdock 147 W Main St Meriden Medical (Hampathic) Derby March 8 Sec Dr Joseph H Evans 1488 Chapel St New Haven

DELAWARE Dover July 12 14 Sec Medical Council of Delaware Dr Joseph S McDaniel 229 S State St Dover

DISTRICT OF COLUMBIA Washington Jan 10 11 Sec Dr George C Ruhland 203 District Bldg Washington

FLORIDA Jacksonville June 13 14 Sec Dr William M Rowlett Box 786 Tampa

GEORGIA Atlanta June Joint Sec State Examining Boards Mr R C Coleman 111 State Capitol Atlanta

IDAHO Boise April 5 6 Commissioner of Law Enforcement Hon J L Balderston 205 State Capitol Bldg Boise

ILLINOIS Chicago Jan 25 27 April 5 7 June 28 July 1 and Oct 18 20 Superintendent of Registration Department of Registration and Education Mr Homer J Byrd Springfield

INDIANA Indianapolis June 21 23 Sec Board of Medical Registration and Examination Dr J W Bowers 301 State House Indianapolis

IOWA Basic Science Des Moines Jan 11 Sec Dr W L Strunk Decorah

MAINE Portland March 8 9 Sec Board of Registration of Medicine Dr Adam P Leighton 192 State Street Portland

MASSACHUSETTS Boston March 8 10 Sec Board of Registration in Medicine Dr Stephen Rushmore 413 F State House Boston

MICHIGAN Ann Arbor and Detroit June 15 17 Sec, Board of Registration in Medicine Dr J Earl McIntyre 202 3 4 Hollister Bldg Lansing

MINNESOTA Minneapolis Jan 18 20 Sec Dr Julian F Du Bois 350 St Peter St Paul

MONTANA Helena April 5 6 Sec Dr S A Cooney 205 Power Block Helena

NEBRASKA Basic Science Omaha Jan 11 12 Dir Bureau of Examining Boards Mrs Clark Perkins State House Lincoln

NEVADA Reciprocity Carson City Feb 7 Sec Dr John E Worden Capitol Bldg Carson City

NEW HAMPSHIRE Concord March 10 11 Sec Board of Registration in Medicine Dr Fred E Clow State House Concord

NEW JERSEY Trenton June 21 22 Sec Dr James J McGuire 28 W State St Trenton

NEW MEXICO Santa Fe April 11 12 Sec Dr Le Grand Ward 135 Sena Plaza Santa Fe

NEW YORK Albany Buffalo New York and Syracuse Jan 24 27, June 27 30 and Sept 19 22 Chief Professional Examinations Bureau, Mr Herbert J Hamilton 315 Education Bldg Albany

OREGON Basic Science Portland March 19 Sec State Board of Higher Education Mr Charles D Byrne University of Oregon Eugene

PUERTO RICO Santurce March 1 Sec Dr O Costa Mandry Box 536 San Juan

SOUTH DAKOTA Pierre Jan 18 19 Director of Medical Licensure Dr B A Dyer Pierre

VERMONT Burlington Feb 8 Sec Board of Medical Registration Dr W Scott Nay Underhill

WEST VIRGINIA Huntington March 21 23 Sec Public Health Council Dr Arthur E McClue State Capitol Charleston

WISCONSIN Madison Jan 11 14 Sec Dr Henry J Gramling 2203 S Layton Blvd Milwaukee

WYOMING Cheyenne Feb 7 Sec Dr G M Anderson Capitol Bldg Cheyenne

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL January 1 page 68

Idaho October Report

Hon J L Balderston, Commissioner of Law Enforcement, reports the written examination held by the Idaho State Board of Medical Examiners at Boise, Oct 5-6, 1937. The examination covered 23 subjects and included 160 questions. An average of 75 per cent was required to pass. Fourteen candidates were examined, all of whom passed. Nineteen physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad	Per Cent
University of California Medical School	(1937)	83	
George Washington University School of Medicine	(1937)	77	
Northwestern University Medical School	(1937)	87	
Rush Medical College	(1933) 85, (1936) 84	(1937) 82	85

School of Med of the Division of the Biological Sciences	(1937)	81
University of Illinois College of Medicine	(1934)	84
Louisiana State University Medical Center	(1934)	84
University of Rochester School of Medicine	(1934)	84
University of Oregon Medical School	(1936) 82	81
McGill University Faculty of Medicine	(1936)	86

School	LICENSED BY ENDORSEMENT	Year Endo Grad
Northwestern University Medical School	(1934)	84
Rush Medical College	(1936)	84
Indiana University School of Medicine	(1937)	84
State University of Iowa College of Medicine	(1931)	84
University of Kansas School of Medicine	(1929)	84
Louisiana State University Medical Center	(1936)	84
Washington University School of Medicine	(1931)	84
(1934) Montana (1934) (1935) Missouri		
Creighton University School of Medicine	(1924)	84
University of Nebraska College of Medicine	(1903)	84
(1925) Montana		
Syracuse University College of Medicine	(1930)	84
University of Cincinnati College of Medicine	(1931)	84
University of Oregon Medical School (1928) Montana	(1936)	84

Georgia October Examination

Mr R C Coleman, joint secretary, reports the written examination held by the Georgia State Board of Medical Examiners at Atlanta, Oct 12-13, 1937. The examination covered 10 subjects and included 100 questions. An average of 80 per cent was required to pass. Two candidates were examined, both of whom passed. The following schools were represented:

School	PASSED	Year Grad	Per Cent
Northwestern University Medical School	(1928)	87	
Cornell University Medical College	(1934)	84	

Seven physicians were licensed by reciprocity and one physician was licensed by endorsement from August 3 through November 2. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Emory University School of Medicine	(1937)	Mississippi	
(1934) North Carolina			
Woman's Medical College of Pennsylvania	(1928)	Penn.	
Medical College of the State of South Carolina	(1927)	South Carolina	
Medical College of Virginia	(1914), (1929)	Virginia	
University of Virginia Department of Medicine	(1909)	W Virginia	

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad
University of Oregon Medical School	(1933)	84

Arizona October Report

Dr J H Patterson, secretary, Arizona State Board of Medical Examiners, reports the written examination held at Phoenix, Oct 5 6, 1937. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Four candidates were examined, three of whom passed and one failed. Six physicians were licensed by endorsement.

School	PASSED	Year Grad	Per Cent
Chicago Medical School	(1937)	80	
Rush Medical College	(1935)	85	
Creighton University School of Medicine	(1935)	86	

School	FAILED	Year Grad	Per Cent
Creighton University School of Medicine	(1936)	81	

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad
College of Medical Evangelists	(1937) 2	84
University of Cincinnati College of Medicine	(1936)	84
Jefferson Medical College of Philadelphia	(1928)	84
University of Pennsylvania School of Medicine	(1927)	84
McGill University Faculty of Medicine	(1926)	84

Tennessee September Examination

Dr H W Qualls, secretary, Tennessee State Board of Medical Examiners, reports the written examination held at Memphis, Sept 29-30, 1937. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Twenty-four candidates were examined, all of whom passed. The following school was represented:

School	PASSED	Year Grad	Per Cent
University of Tennessee College of Medicine	(1937)	84	
82 6 82 9 82 8 84 4 84 6 84 8 85 2 85 1 85 2 85 3 86 3 86 4 86 4 86 6 86 7 86 5 86 6			

Book Notices

A Laboratory Handbook for Dietetics By Mary Swartz Rose Ph D
Professor of Nutrition Teachers College Columbia University Fourth
edition Cloth Price \$3 Pp 322 New York Macmillan Company
1937

For many years this has been a standard textbook for college laboratory classes in dietetics and an invaluable source of reference material for all those concerned with practical problems in dietetics. In the eight years since the publication of the third edition, much new information has accumulated concerning the mineral and vitamin content of foods. In consequence, the tables giving mineral elements and vitamins have not only been completely recalculated but almost doubled in size. The average vitamin values are reported in terms of Sherman units. These values have been selected after careful consideration of the published analyses, which necessarily vary widely for the same kind of food owing to differences in variety, maturity, climate and soil. They are intended primarily to give a basis for comparison of the relative vitamin potency of various foods. The tables of vitamin values are particularly useful, because figures for cooked foods have been included wherever these are available. In addition to the numerous conveniently arranged reference tables the handbook contains a brief discussion of the composition of food materials, functions of foods, and the food requirements of normal adults and children. Standard vitamin allowances estimated in terms of Sherman units per hundred calories have been proposed. In the light of the most recent studies available the vitamin A and G allowances appear to be generous, although higher standards for vitamin B₁ and C intakes might be considered desirable. This book deserves a place in the library of all physicians.

Some Quantitative Aspects of the Biological Action of X and γ Rays
By C M Scott Medical Research Council Special Report Series No
223 Paper Price 1s 6d Pp 99 with 21 illustrations London His
Majesty's Stationery Office 1937

The monograph is in pamphlet form and is divided into two parts. In the first part the author briefly sets forth and analyzes the experimental evidence bearing on the mechanism involved in the action of roentgen rays and the gamma rays of radium on living tissue. The second part is devoted to a report of experiments carried out by the author to elucidate certain phases of the action of roentgen rays and radium on tissues. He selected the muscular tissue of the heart as an example of a tissue that is known to be resistant to irradiation, and in contrast the eggs of the bluebottle fly, which are distinctly sensitive to irradiation. These experiments were designed to elucidate the effect of varying the intensity of irradiation as affected by temperature, by injury and by irradiation, separately or combined the effect on radiosensitivity of injury produced by asphyxia or by roentgen rays or both, and the effect on radiosensitivity of anesthesia such as chloroform, nitrous oxide, ether and certain fat solvents such as petroleum ether, by themselves or in combination with roentgen irradiation. The first part in which the author discusses and analyzes the evidence bearing on the action of roentgen rays and the gamma rays of radium on living tissue, is a model of concise and clear writing and of sound thinking. This monograph should be read by every one who wishes to know and to understand as much as possible about the action of roentgen rays and gamma rays of radium on living cells as far as this is now known.

Memoranda of Toxicology By Max Trumper BS AM Ph D
Consulting Clinical Chemist and Toxicologist Third edition Fabrikoid
Price \$2 Pp 304 Philadelphia P Blakiston's Son & Co Inc 1937

One of the neglected branches in the teaching of medicine is toxicology, mainly because a complete fundamental understanding of all basic sciences must be comprehended by the student before he can fully understand the close relationship between the diagnosis and treatment of poisoning. With the introduction of many new drugs and health injurious solvents in industry, accurate knowledge must be provided to the beginning practitioner to diagnose and treat the toxic effects. The pocket size of this volume makes it an indispensable tool for

emergency calls. Though Trumper does not deviate from the general outline of toxicologic textbooks dealing with corrosives, simple and specific irritants and neurotic poisons, his hundred page appendix on reptile venoms, insect bites, insulin, thallium, dinitrophenol and zinc stearate poisoning gives information otherwise available with difficulty. The addenda on alcoholism, lipid solvents and first aid and the emphasis on gas mask service make this little book a real contribution to practical medicine. For the older physician the treatment on hydrogen ion concentration—the bugbear of many medical minds—is presented in a simple and understandable manner.

Story of Nevada State Medical Society and Nevada Medicine By
M R Walker MD Paper Price 75 cents Pp 45 Reno Nevada
The Author [n d]

This pamphlet was prepared by one who has practiced medicine in Nevada for many years, having gone to Reno in 1900 before that city was incorporated. While the earliest records of the activities of Nevada physicians have been lost, they concerned for the most part the few doctors who passed through previous to 1850 on their way to the California gold fields. Only seven physicians attended the first meeting, called in 1872 at Pioche. When the Nevada State Medical Society was organized at Virginia City in 1875, it was not feasible to hold yearly meetings because of the small number of physicians. This organization at a meeting in 1894 at Reno elected Dr Henry Bergsteine as delegate to the annual session of the American Medical Association in San Francisco that year. In 1904 a meeting was called to reactivate the state society. This group declared the old society defunct and formed a new organization with twenty-one charter members. The first annual meeting of the new society was held in May 1905 in Reno. The author gives brief accounts of many annual meetings of the state medical society, some of which were held in the offices of members in Reno, others at the Elks Hall in Goldfield or at Lake Tahoe. When the San Francisco earthquake and fire occurred in 1906, many of its members volunteered to go to San Francisco to help in that disaster. Among the changes that have occurred in Nevada medicine in the last thirty-seven years, the author points out the appearance of typhoid and "tick fever" as new diseases in that community. The condition that amazes him, however, is the increasing prevalence of nervous disorders. The first general hospital in Nevada apparently was St Mary's in Virginia City, built in 1875. Nevada became a state in 1864, Reno was founded about 1868, and the State Hospital for Mental Diseases was built in 1881. There are twenty hospitals in the state now. The author reviews industrial medicine and surgery as practiced in the construction of Boulder Dam from 1931 to 1936. In view of the outbreak in Chicago in 1933 of amebic dysentery, the Boulder Dam officials would hire no food handlers who had been employed in the previous six months anywhere in northern Illinois. No cases of amebic dysentery developed in the Boulder Dam camp. The Boulder Dam studies of heat prostration showed that the cause of much heat prostration was the loss of salts, especially sodium chloride, in the excessive perspiration.

Personal Hygiene By C E Turner MA Dr PH Professor of
Biology and Public Health in the Massachusetts Institute of Technology
Cloth Price \$2.25 Pp 335 with 87 illustrations St Louis C V
Mosby Company 1937

This book, intended for instruction in health at the university level, is the outgrowth of the same author's previous volume *Personal and Community Health*, but contains additional material. Beginning with a chapter on student attitude, in which appears the author's widely quoted definition of health and in which he expresses a sensible philosophy toward health which avoids both negligence and hypochondriasis, he discusses in successive chapters nutrition, digestion, oral hygiene, respiration, circulation, excretion of nitrogenous waste, skin, endocrines, sense organs, nervous system, mental hygiene, bodily activity, body mechanics, food hygiene, reproduction, heredity, narcotics and stimulants, responsibility for health maintenance, communicable diseases and immunity and in an appendix, the individual communicable diseases. The book is liberally and intelligently illustrated. There is a good glossary and an ade-

quate index. The book teaches hygiene on the basis of physiology, giving enough and not too much information for the groups for which the book is intended, to serve as an adequate background for the health practices which he recommends. The latter are sensible and practical, especially with relation to touchy subjects such as alcohol, tobacco, tea, coffee and sex hygiene. The author, though not a physician, has a clear conception of individual responsibility for health and the physician-patient relationship. The volume, though intended for a textbook, would be an excellent reference book for the library of any family in which a sensible interest in health exists.

Die Vitamine und ihre klinische Anwendung. Ein kurzer Leitfaden. Von Prof. Dr. W. Stepp, Direktor der I. Medizin. Universitätsklinik München. Doz. Dr. J. Kühnau, Direktor des Stadt. Forschungsinstituts für Baderkunde und Stoffwechsel Wiesbaden und Dr. phil. et med. habil. H. Schroeder, Ass. Arzt an der I. Medizin. Universitätsklinik München. Second edition. Cloth. Pp. 189. Stuttgart: Ferdinand Enke, 1937.

An enlarged edition of this German monograph makes its appearance a little more than a year after the first. The authors again have succeeded in putting in brief form an extraordinary amount of information on the vitamins. The newer material includes a more detailed discussion of the functions of vitamin A with particular reference to its possible therapeutic uses, a discussion of the "filtrate factor" of the vitamin B complex, a brief account of vitamin K and a paragraph with references on the recent work on vitamin P. The monograph will prove most useful as a source of suggestions regarding further clinical studies, particularly on the vitamins available in crystalline form.

This book, in conjunction with other articles on the vitamins, emphasizes the need for a suitable international system of biochemical nomenclature. Early in 1937 Szent-Gyorgyi reported the presence of a substance, associated with vitamin C in nature, which was concerned with the maintenance of normal permeability of small blood vessels. This factor was identified as citrin, but the name vitamin P has also been bestowed on it, the letter P referring to the supposed relationship of this factor to the permeability of the capillaries. A vitamin L is concerned with lactation in experimental animals. A factor T, seemingly identical with vitamin K, is concerned with the maintenance of a normal "thrombozytenzahl" in hens. Vitamin H, as the term is used by the present authors, is the "haute faktor" of Gyorgy, but the book makes no mention of the two other substances, which are described in the American literature as vitamin or factor H. The name which the authors of this monograph use for vitamin B₂ is "aneurin," whereas most American workers probably would use the name "thiamin chloride." Commercial preparations of this crystalline substance, vitamin B₁, have been introduced under such names as Betabion, Betavin and Betanerva, the multiplicity of names adds to the confusion.

This book will be most useful to persons who already have a considerable knowledge of the vitamins. It will serve as a summary of recent contributions to the subject, particularly those of a clinical nature. The chief advantage of the book is its brevity, and therein also lies its deficiency. The tendency of the authors to catalogue everything may tend to give the unwary reader the false idea that the whole subject of the vitamins is definitely settled.

The Science of Seeing. By Matthew Luckiesh, D.Sc., D.E., Director Lighting Research Laboratory, General Electric Company, Nela Park, Cleveland, and Frank K. Voss, E.E., Physicist, Lighting Research Laboratory. Cloth. Price \$6. Pp. 548, with 143 illustrations. New York: D. Van Nostrand Company, Incorporated, 1937.

The ambitious caption of this latest publication by Luckiesh and Voss would suggest that this treatise is an effort to coordinate the kaleidoscopic knowledge bearing on light and vision. However, as in the previous works of these authors, the book deals essentially with lighting for seeing, which would have been a more appropriate and less misleading title. These investigators from the Lighting Research Laboratory of the General Electric Company, have been stressing for more than twenty years the importance of more and more light. That this evangelism has not been in vain is evidenced by the increasingly better lighting of stores, offices, factories and homes. Inadequate light admittedly causes eyestrain, fatigue

and decreased visual efficiency, but the authors would attribute to this cause also the defective vision of intellectual workers, and even to some degree the increase in defective vision occurring with age. To them "it is conceivable that the reflex effects of critical seeing and the prevalence of mortality caused from heart trouble in occupations demanding critical seeing may be related." The major problems of lighting practice—quantity, distribution and spectral quality—are interestingly discussed with the authority derived from personal research. Illumination above mere visual requirements increases visual efficiency—"production foot-candles", further increments add to the ease of seeing, thus reducing nervous tension and promoting human welfare—"humanitarian foot-candles". Industrial production could be increased 10 per cent by increasing the present average of less than 5 to 25 foot-candles. There is no magic in colored papers or in colored glasses. On the rifle range, yellow-green glasses reduce the veiling blue haze of distance. At night on the highway, however, colored glasses by diminishing visibility become a hazard. Glasses are sold for protection from ultraviolet energy when there is no energy of this sort ordinarily present in sufficient amounts to be harmful. For the lay reader much practical information of this type is popularly presented, while the interest of the technically indoctrinated will be stimulated by the many novel instruments and experiments described.

The Physiology of Domestic Animals. By H. H. Dukes, D.V.M., Professor of Veterinary Physiology, New York State Veterinary College, Cornell University. With a chapter on the Physico-Chemical Basis of Physiological Phenomena. By F. A. Hewitt, D.V.M., Ph.D., Associate Professor of Veterinary Physiology, Division of Veterinary Medicine, Iowa State College. A Part on Reproduction. By G. W. McVitt, D.V.M., revised by S. A. Asdell, M.A., Ph.D., Professor of Animal Physiology, New York State College of Agriculture, Cornell University. And a foreword by H. D. Bergman, D.V.M., Professor of Veterinary Physiology and Pharmacology, Division of Veterinary Medicine, Iowa State College. Fourth edition. Cloth. Price \$6. Pp. 695, with 16 illustrations. Ithaca, New York: Comstock Publishing Company, Inc., 1931.

This was written primarily for students in veterinary medicine, but little of the original material is derived from veterinary sources. The references accompanying each section duplicate closely those found in textbooks of advanced physiology for medical students. Furthermore, the comparative physiology of domestic animals has scarcely received the attention that might be expected from the veterinary group. Examination of the text shows a surprising dearth of discussion from a comparative point of view. Only occasionally are there references to differences in physiologic behavior in different species, the most complete presentation being in the sections on nutrition and metabolism and on reproduction. The textual material is conventionally sound, clearly presented and well arranged and is sufficiently advanced to be useful to medical students as a reference work.

Diseases of the Blood and Atlas of Hematology With Clinical and Hematologic Descriptions of the Blood Diseases Including a Section on Technique and Terminology. By Roy R. Kracker, M.D., Professor of Bacteriology, Pathology and Laboratory Diagnosis, Emory University School of Medicine, Atlanta, Georgia, and Hortense Elton Garver, M.D., Instructor in Laboratory Diagnosis, Emory University School of Medicine. Cloth. Price \$15. Pp. 532, with 61 illustrations. Philadelphia: London & Montreal: J. B. Lippincott Company, 1937.

This book is an answer to what the authors feel is a need for an American atlas of hematology to include both the clinical and the laboratory aspect of diseases of the blood. The preface states that the drawings have been made from preparations stained with Wright's stain, although there are some employing the supravital and peroxidase stains. The normal blood picture of laboratory animals, which, as the authors state, is difficult to find in medical literature, is given a chapter and should be welcomed by many investigators. The text begins with a discussion of hematologic terminology involving an analysis of the origins and current usage of many of the terms. The discussion, which is badly needed by students and practitioners, is clear. The second chapter contains a long list of definitions of hematologic terms. The illustrations are good and the publishers as well as the authors deserve congratulations for the accurate reproduction of colors. The section on hematologic technique has omitted much cumbersome material and discusses on the whole merely the more important material.

ods The inclusion of the Tallqvist hemoglobin scale and of only one method of determining sedimentation rate might be questioned, but, on the whole, this chapter is thoroughly adequate The book will doubtless find a place on the shelves of laboratory technicians, medical students, pathologists, and those practicing physicians who wish to add a reasonable knowledge of blood morphology to their other diagnostic armamentarium

Research Memorandum on Recreation in the Depression By Jesse F. Stelmer Professor of Sociology University of Washington Prepared under the direction of the Committee on Studies in Social Aspects of the Depression Bulletin 32 Paper Price \$1 Pp 124 New York Social Science Research Council 1937

The seven parts of this monograph deal with recreational research, its problems, trends and source, with the recent expansion of leisure, with the changing tide of recreation, with recreation facilities under governmental auspices, with community organization for leisure, with recreation as a business enterprise, and, finally, with the future of recreation The principal conclusion at which the study arrives is that factual information about recreation is inadequate and unreliable The committee believes that leisure time, while increased during the depression, has not been increased uniformly for the whole people and that there has been, in fact, some decrease in leisure time There has been as a result of the depression considerable decrease in recreational facilities in spite of the fact that certain relief projects have been in the field of recreation Commercial recreation has fared surprisingly well during the depression in comparison with other forms of business Typical of the problems raised by the report is the following paragraph

Questions need to be raised also concerning our popular appraisal of the quality of leisure time activities Are our widely accepted notions of what is wholesome or unwholesome in recreation scientifically sound or are they emotional judgments growing out of the mores of our times? How can values be measured in the field of recreation? Are recent changes in recreational fashions and attitudes in the interests of human welfare? What kinds of evidence can be produced that will enable us to evaluate present recreational trends?

The monograph seems to be strictly what its title indicates, namely, a memorandum indicating probable lines along which research should be carried out with respect to recreation It should be in reference libraries for the information of persons interested in community welfare and especially in recreation activities

Latent Syphilis and the Autonomic Nervous System By Griffith Evans M A D M F R C S Second edition Cloth Price \$3 Pp 158 with 50 illustrations Baltimore William Wood & Company 1937

The author discusses the place of syphilis in the etiology of diseases of the thyroid gland, asthma, angioneurotic edema, purpura, blanching and congestion of the extremities, claudication, abdominal adhesions, nervous dysphagia and pes cavus in a most unconvincing manner It would seem that the author is unduly and unjustifiably impressed with the part that syphilis plays in the cause of certain clinical entities Obviously the book is not recommended

Allergiya Zbirnik prats konferentsii po alergii sklikanoi v m Kievi z 1 po 4 Iunio 1936 p Institutom klinichnoi fiziologii an URSR i Institutom Eksperimentalnoi Biologii i Patologii NKOZ URSR Direktor Institutiv—O O Bogomolets Allergie Travaux de la conference tenue à Kiev le 1-4 Fevrier 1936 et organisée par l'Institut de physiologie clinique de l'Académie des sciences de la RSS d'Ukraine et l'Institut de biologie et de pathologie expérimentales du commissariat du peuple de la santé publique de la RSS d'Ukraine Directeur A Bogomolets membre de l'Académie Paper Price 15 krp Pp 320 with illustrations Kiev l'Académie des Sciences de la RSS d'Ukraine 1937

This is a collection of papers read before the Conference on Allergy organized by the Ukrainian Academy of Sciences and the Institute of Experimental Biology and Pathology, Feb 1-4 1936 The various aspects of the subject were discussed under the headings of the mechanism of typical allergic processes the role of the nervous system in the development of allergy, the role of allergy in the pathogenesis of the infectious diseases (tuberculosis, rheumatism, endocarditis and so on), pathologic morphology of allergic processes hetero allergy and the role of external factors in allergic manifestations In summarizing the results of the conference O O Bogomolets expressed the opinion that the number of purely allergic diseases will be

considerably reduced At the same time allergy is to be regarded as a component of a number of disease states particularly those of infectious character The question of whether allergy is a beneficent or an injurious factor depends on whether one regards it as a dynamic state which precedes the state of immunity and is necessary for its development When allergy does not pass on to immunity it becomes an injurious factor, creating a therapeutic problem of its removal through desensitization Sensitization, both specific and nonspecific, constitutes the obligatory sign of allergy Among the interesting points established by the conference, Bogomolets points out the establishment of irrefutable evidence of the cellular nature of allergic reactions Anaphylaxis appears as the more specific allergic manifestation The role of precipitins in absorption shock is still obscure The papers reflect a keen interest in the subject of allergy on the part of Russian clinicians and extensive experimental work directed toward the solution of the many problems the subject presents Each paper is written in the Ukrainian or Russian and accompanied by either French or English translations

Der Schiffs und Hafenarzt Ein Leitfaden für Ärzte und Seeleute Herausgegeben von Dr Friedrich Kortenhans Unter Mitarbeit von Dr med Heinz Spranger Dr med Eduard Wolf Dr med Friedrich Kortenhans und Dr med Friedrich Höder Mit einem Geleitwort von Prof Dr Relter Präsident des Reichsgesundheitsamtes Paper Price 6.50 marks Pp 185 Jena Gustav Fischer 1937

This is a German manual for the ship's physician and the medical officer of ports including both seaports and other ports of entry into the nation It deals with international health conventions with special reference to the needs of German ship and port physicians It sets forth in detail the regulations governing German physicians in the German merchant marine and the control of communicable diseases in ports and on ships, including the use of the radio communication at sea except the SOS The manual will be of little use to American physicians in general, except as they may find it of general interest To officials dealing with international quarantine and health and medical service at sea, it is a valuable supplementary volume

General Hygiene and Preventive Medicine A Text Book for College Students Medical Students Nurses Public Health Workers and Social Workers By John Weinzierl MS PhD Dr PH Edited by Adolph Weinzierl BS MD CPH Health Officer Portland Oregon Cloth Price \$4 Pp 424 Philadelphia Lea & Febiger 1937

This volume is intended primarily for college students in the upper divisions, medical students, nurses and teachers in training The subject, the author states in the preface, is approached from an essentially new point of view that of the methods employed to control disease, all other matter being held subordinate to that end The book however, barely escapes being a catalogue For example, there are only slightly over two pages on the subject of pneumonia and almost exactly the same space for eye strain An interesting deviation from the conventional presentation is the inclusion of eugenic measures in preventive medicine under which head moronism epilepsy and migraine are discussed This book would be suitable for college students teachers and the general public but would be totally inadequate for medical students or perhaps even nurses, all of whom should have a much wider knowledge of hygiene and preventive medicine For the first mentioned groups, however, the clarity and brevity of presentation is highly desirable

The Machinery of the Body By Anton J Carlson and Victor Johnson Cloth Price \$4 Pp 380 with 187 illustrations Chicago University of Chicago Press 1937

As stated in the preface, this book is based on the presentation of physiology to college students and as such reflects much of the fundamental point of view underlying the attempt at correlation of knowledge as introduced into the curriculum at the University of Chicago The text is interestingly and concisely written, simplified yet accurate The subject matter embraces a wide range—biologic philosophy, physical chemistry, biology, general physiology, physiologic anatomy, human physiology and physiologic hygiene The authors have succeeded more completely than any others with whom the reviewer is

acquainted in bringing together in close integration all the physiologic relationships of the human race. The illustrations are well chosen and apparently mostly original, and the tables are original in arrangement. The indexing is complete and there is a list of supplementary reference monographs and textbooks. A bibliography of original sources is not included, probably because it would be too voluminous if one may judge from the extent, range and detail of subject matter.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Optometry Practice Acts Acceptance of Employment by Resident Optometrist from Nonresident Optical Company Prohibited—One Soland filed a complaint in the superior court of Marion County, Ind., against the Indiana State Board of Registration and Examination in Optometry, its individual members and the attorney general of the state, seeking a declaratory judgment and an injunction to prevent the enforcement of certain sections of the Indiana optometry practice act. While that complaint was pending, one Bennett, a licensed optometrist, filed an intervening petition, after the filing of which the original complaint by Soland was dismissed. Another optometrist also filed an intervening petition asserting the validity of the act and praying that the board be mandated to enforce it. The trial court upheld the validity of the act and mandated its enforcement. Bennett then appealed to the Supreme Court of Indiana.

Bennett contended that a section in the act prohibiting him from accepting employment from any person other than one who resides within the state and who holds a valid, unrevoked certificate of registration as an optometrist was unconstitutional in that it deprived him of a property right guaranteed by the Constitution. He contended that even if his employer is a nonresident and not licensed in Indiana, nevertheless he, as a regularly and duly licensed optometrist, cannot be deprived of the right to follow his profession within the state and that the fact that his employer is a nonresident bears no relation to the protection of the public health or the general welfare and safety of the citizens of the state. The relation of an optometrist to his patient, said the Supreme Court, is much the same as that of a physician and patient. The practice of optometry, as the practice of medicine, directly affects public health and is a proper subject for legislative regulation and control. The relationship with the patient is personal. Notwithstanding this relationship, the court continued, the appellant, Bennett, takes the position that the fact that the practitioner, duly licensed by the state, is employed by an unlicensed employer can bear no relation to public health. The relationship between the licensed optometrist and his unlicensed employer is that of master and servant. The master is in a position wherein he may dictate to his servant the manner of conducting his business and the kind and nature of the goods to be sold and furnished to the patient, in order to procure the most favorable financial gain to the employer. And this may be done without regard to the public health, since the employer is a nonresident and beyond the jurisdiction of the courts of Indiana, and not licensed. The principal purpose of the act is to protect the public from quacks, and from persons or firms, not licensed, but who, as nonresident manufacturers of eyeglasses, employ licensed optometrists to conduct the manufacturer's business in Indiana for profit. The act prohibits such employment. It is not for the court to say that the legislature was without authority to enact a law condemning that relationship and practice.

The act further forbids certain advertisements and publications likely to mislead and deceive the public. Bennett admitted on the witness stand that advertisements exhibited to him were distributed by handbills and through the medium of the press, and that they contained statements prohibited by the act. These advertisements were furnished and paid for by the unlicensed, nonresident manufacturers. Many acts similar to the Indiana

act as to its regulatory provisions, said the court, have been upheld almost without dissent. That such acts are held to be a proper exercise of the police power for the purpose of safeguarding public health, and do not amount to the taking of property without due process of law or the denial of the equal protection of the law, has been asserted by the courts many times. The Indiana legislature has declared that the safety of the public and the health of the community require the safeguards that are placed around the practice of optometry and the court was unable to say that the act, as a whole, was not a valid exercise of the police power. The judgment of the lower court was therefore affirmed.—*Bennett v. Indiana State Board of Registration and Examination in Optometry et al (Ind.)*, 7 N. E. (2d) 977.

Medical Practice Acts Osteopath's Qualifications for License Without Examination Based on Prior Practice—Daley, an osteopath, applied for a writ of mandamus to require the department of education of New York to issue him without examination, a license to practice osteopathy. The trial court refused to issue the writ and Daley appealed to the supreme court, appellate division, third department, New York.

Daley based his right to a license without examination primarily on section 14, c 344, Laws of New York, 1907 (approved May 13, 1907), which provided in part that

any person who shall be actively engaged in the practice of osteopathy in the state of New York on the date of the passage of this act, shall upon application be granted without examination a license to practice osteopathy provided application for such license be made within six months after the passage of this act.

Daley, apparently, had practiced osteopathy in New York from August 1901 to January 1907, at which date he left New York state and engaged in practice in New Jersey and Vermont. He did not apply for the license within the six month period but when he did apply, in 1932, he relied on an amendment passed in 1928 providing

In the event any person who is not registered or licensed because of some error misunderstanding unintentional omission or other cause which the regents may determine to be excusable shall submit to the regents satisfactory proof that he possessed all the requirements prescribed by law at the time required for registration or license or their equivalents, he may by action of the regents, receive from the education department a license.

Daley, said the supreme court, was not practicing in New York when the act of 1907 was passed and hence did not possess the qualifications for licensure under that act. He contended, apparently, that his failure to obtain a license was due to error, misunderstanding or unintentional omission within the meaning of the 1928 amendment. But, said the court, Daley's departure and absence from New York, and his failure to practice in the state, were not due to any of those causes. The court was not prepared to hold that the legislature, by either act mentioned intended to admit to the practice of osteopathy in New York without an examination, all of those who were practicing osteopathy in other states when the 1907 act was enacted. The supreme court accordingly affirmed the judgment of the trial court denying a writ of mandamus.—*Daley v. Byrne (N. Y.)* 29, N. Y. S. 452.

Society Proceedings

COMING MEETINGS

American Academy of Orthopedic Surgeons Los Angeles Jan 16
Dr Carl E Badgley 1313 East Ann St Ann Arbor Mich Secretary
American Orthopsychiatric Association Chicago Feb 24 26 Dr Norrie
C 1a Mar 210 East 68th St New York Secretary
Annual Congress on Medical Education and Licensure Chicago Feb 14
15 Dr W D Cutter 535 North Dearborn St Chicago Secretary
Middle Section American Laryngological Rhinological and Otorhinolaryngological Society St Louis Jan 26 Dr James B Costen Beaumont Bl
St Louis Chairman
Pacific Coast Surgical Association Los Angeles Feb 22 23 Dr 11
Glenn Bell University of California Hospital San Francisco Secretary
Southern Section American Laryngological Rhinological and Otorhinolaryngological Society Atlanta Ga Jan 24 Dr Murdoch S Eucken 144 Fulton Ave N E Atlanta Ga Chairman
Western Section American Laryngological Rhinological and Otorhinolaryngological Society Santa Barbara Calif Jan 29 30 Dr Arthur C Jones La
man Bldg Boise Idaho Chairman

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them. Titles marked with an asterisk (*) are abstracted below.

Am J Roentgenol & Rad Therapy, Springfield, Ill

38 677 820 (Nov.) 1937

- Responsibilities of the Radiologist B R Kirklin Rochester Minn—p 677
- Spinal Extradural Cyst and Kyphosis Dorsalis Juvenilis R B Cloward and P C Bucy Chicago—p 681
- *Calcification About the Posterior Portion of the Greater Tubercle of the Humerus Differentiation from Supraspinatus Tendon Calcification Report of Four Cases J J Fahey and P H Harmon Chicago—p 707
- Methods of Roentgen Examination of Gastro-Intestinal Tract J C Bell Louisville Ky—p 711
- *Roentgen Treatment of Infection from Human Bite R M Smith and W F Manges Philadelphia—p 720
- Review of Literature on Experimental Roentgen Therapy W F Manges and R M Smith Philadelphia—p 726
- Treatment of Epitheliomas of Nasolabial Fold O N Meland Los Angeles—p 730
- Radium Treatment of Vernal Conjunctivitis H H Bowing and R E Fricke Rochester Minn—p 740
- Cancer of the Eyelids G A Robinson New York—p 743
- Protective Shields in Radiation Therapy of Intra Oral Cancer A J Ackerman New York—p 746
- Production of Supervoltage Roentgen Rays by Means of an Electrostatic Generator R Dresser J G Trump and R J Van de Graaff Boston—p 758
- Coordination of Physical and Biologic Dosage in High Voltage and Supervoltage Roentgen Therapy T Leucutia and K E Corrigan Detroit—p 762
- Dosage Measurements on Ten 400 Kilovolts Roentgen Ray Generators O Glasser Cleveland—p 769
- Use of Pitressin for Elimination of Intestinal Gas in Roentgenography of Genito-Urinary Tract and Gallbladder L W Paul Kansas City Mo and S R Beatty Madison Wis—p 776
- Postural Treatment of Infant Colic W Snow New York—p 779
- Visualization of Shatter Proof Glass in Tissues J M Dell Jr Gainesville Fla—p 781

Calcification About the Greater Tubercle of the Humerus—Fahey and Harmon report four cases of calcification about the greater tubercle of the humerus. Such instances are not uncommon, eighty cases of calcification in the supraspinatus tendon have been seen concomitantly at the University of Chicago Clinics. Differentiation from the more common supraspinatus calcification is readily made by an anteroposterior roentgenogram with the arm in internal rotation. Areas that may appear to be islands of bone in usual x-ray views of the shoulder are thus localized in relation to the greater tubercle. Supraspinatus calcification sometimes escapes and migrates laterally down the side of the greater tubercle. In these cases roentgenograms will show a shadow of calcium deposit distal to the location of the supraspinatus calcification and on the lateral aspect of the tubercle. When supraspinatus calcification is combined with calcification in the posterior tendons the diagnosis is more readily made. In the only case in which operation was performed, calcification both inside and outside the infrapinatus tendon was found.

Roentgen Treatment of Infection from Human Bite—Smith and Manges used roentgen rays in the treatment of nine cases of infection of the hand from human bites. It offers a simple method of treatment which will not interfere with surgical therapy commonly used, when necessary. There was no involvement of bone or joint in the present series of patients. This is not the usual course of events. All the patients had a short convalescent period. In only one case was convalescence prolonged and treatment was not started in this case until ten weeks after injury. This was the only one in which cauterization as advocated by Bites was employed. Material from wounds caused by human bites should be studied carefully in fresh smears in order to find the organisms. The part affected is treated by using a large area with superficial irradiation 1.5 kilovolts 5 milliamperes 4 mm of aluminum filtration

at a distance of 12 inches. Each dose is between 50 and 100 roentgens. The frequency of dosage is determined by the patient's general condition and his reaction to the treatments. In some instances the treatment has been daily and in others it has been at weekly intervals. Relief from pain is usually prompt in from six to twenty-four hours. The swelling subsides more slowly. The lymphangitis and lymphadenitis, when present, respond fairly rapidly. In the majority of instances the convalescent period lasts from one to two weeks. The temperature falls usually by crisis or steeply by lysis.

Annals of Internal Medicine, Lancaster, Pa

11 701 866 (Nov.) 1937

- Thyroid Pituitary Relationship in Diabetes Insipidus T Findley Jr St Louis—p 701
- *Subacute Bacterial Endocarditis Active Cases Without Bacteremia C S Keefer Boston—p 714
- Disturbances of Rate and Rhythm in Acute Coronary Artery Thrombosis A M Master S Dack and H L Jaffe New York—p 715
- Surgical Treatment of Peptic Ulcer I Abell Louisville Ky—p 762
- Reaction and Specific Gravity of the Urine in Relation to Nephritis (A Study of 10 000 Urinalyses) E E Ziegler and A T Brice San Francisco—p 768
- Problems Connected with the Use of Protamine Zinc Insulin H T Ricketts Chicago—p 777
- Some of the Practical Problems in the Serum Therapy of Bacterial Infections A Wadsworth Albany N Y—p 791
- *Comparative Value and Limitations of Trepine and Puncture Methods for Biopsy of Sternal Bone Marrow W Dameshek H H Henstell and Eleanor H Valentine Boston—p 801
- Neurologic Manifestations in Hypoglycemic Shock (Sakel) L A Golden New Orleans—p 819
- *Motor Involvement of the Central Nervous System in Pellagra Report of Two Cases M A Blankenhorn Cincinnati—p 823
- Nutritional Disturbances of the Extreme South J H Musser New Orleans—p 827
- Coffee as a Cause of Cardiac Pain R L Levy New York—p 833

Subacute Bacterial Endocarditis—Keefer presents a summary of fifteen cases of bacterial endocarditis without bacteremia which he has observed during life and at postmortem examination, including the clinical features, the histologic picture of the valves and observations regarding the bactericidal activity of the blood. All the patients had physical signs of valvular disease. Nonsyphilitic aortic regurgitation was present in ten. Only the mitral valve was involved in two and the tricuspid alone in three. There was no essential difference in the clinical course of the patients with bacteremia and those without bacteremia with the possible exception that the patients without bacteremia were more apt to have renal insufficiency as a prominent feature of their illness. Bactericidal studies of the blood of patients with bacterial endocarditis show that some normal persons as well as patients with bacterial endocarditis have antibodies which are capable of killing organisms derived from patients with bacterial endocarditis. Bacterial endocarditis can be produced in animals under the same circumstances as exist in man: the presence of damaged valves, platelet thrombi on the valves, bacteremia and the presence of antibodies. There is highly suggestive evidence that the human cases in which blood cultures are negative have a condition analogous to the experimental endocarditis of horses as described by Wadsworth. It is well to recognize this group of cases, since their study aids in understanding the infection and should encourage one to look for ways of destroying organisms in the valves.

Trepine and Puncture Methods for Biopsy of Sternal Bone Marrow—Dameshek and his associates compared, in twenty consecutive cases, the trephine and the recently popularized puncture methods for biopsy of the sternal marrow. A comparison of the smears made with the trephine and the "puncture" methods showed a far greater cellularity in the biopsy preparations: a greater reticulocyte percentage, a greater number of erythroblastic cells relative to granulocytes and a greater number of early nucleated red cells. The puncture preparations frequently consisted almost entirely of red blood cells interspersed among which were some marrow cells. The sections obtained at biopsy gave one an idea not only of the general topography of the marrow but of its general degree of cellularity and the presence or absence of islands of leukemic or neoplastic cells and in certain cases of connective tissue replacement. Combined study of the sections and of the smears has proved to be of much greater value than study of the one type of preparation alone. Puncture biopsy of the sternum is

to be criticized because the material obtained is usually not marrow but a variable mixture of blood with marrow cells, because lack of cellularity in this aspirated material does not necessarily mean lack of cellularity in the marrow itself, because primitive erythroblastic cells, present in the marrow, are frequently not obtained, and because abnormal islands of neoplastic and leukemic cells are either not obtained or, if seen, may be misinterpreted because of the lack of topographic relationship. The chief advantage of puncture biopsy is its simplicity, but this is greatly outweighed by its inaccuracy.

Motor Involvement of Central Nervous System in Pellagra—Blankenhorn cites two cases of pellagra one resembling hemiplegia and the other diplegia both patients were totally disabled and even "helpless," one for three weeks and the other for six weeks. With intensive dietary treatment both became well. In each case chronic alcoholism was the obvious predisposing cause of pellagra but it is now generally believed that alcoholic pellagra and endemic pellagra are the same disease. The remarkable recovery of the patients, when treated as pellagrins, suggests that the motor involvement of the central nervous system was really part of the syndrome of pellagra.

Annals of Medical History, New York

9 517 586 (Nov.) 1937

- A Portrait Gallery of Physicians: The Collection in the Army Medical Library. H. W. Jones. Washington D. C.—p. 517.
William Cheselden: Some of His Contemporaries and Their American Pupils. F. R. Packard. Philadelphia—p. 533.
The Rise of British Surgery in the Eighteenth Century. F. Beckman. New York—p. 549.
The Famous Case of Lady Anne Conway. G. R. Owen. Los Angeles—p. 567.

Archives of Dermatology and Syphilology, Chicago

36 1129 1312 (Dec.) 1937

- The Processes and Organization of Graduate Medical Education. President's Address. J. H. Stokes. Philadelphia—p. 1129.
Epididymitis. S. Ayres Jr. and N. P. Anderson. Los Angeles—p. 1149.
Epidermophytosis. Report of Cases in Three Brothers. One of Whom Showed a Hitherto Undescribed Clinical Type on the Scalp. H. C. Gjessing and K. Mossige. Oslo, Norway—p. 1154.
*Reactions to Mapharsen with Especial Reference to Its Use in Patients Who React to Arphenamines. J. W. Jordan and H. L. Traenkle. Buffalo—p. 1158.
Sensitization of Guinea Pigs to Poison Ivy. J. E. Ginsberg. Chicago. F. T. Becker. Minneapolis and S. W. Becker. Chicago—p. 1165.
A Method of Staining Hair and Epithelial Scales. D. A. Berberian. Beirut, Syria—p. 1171.
Superficial Lymphatic Capillary Network of the Skin. Its Demonstration in Various Cutaneous Diseases. O. L. Levin, S. H. Silvers and S. S. Berkowitz. New York—p. 1176.
Sense of Smell of Patients with Neurosyphilis. Especially of Those with Dementia Paralytica. L. W. Darragh, Northampton, Mass.—p. 1181.
Cutaneous Leprosy. Presumable Cure by Surgical Removal of Lesion. N. E. Wayson. Staten Island, N. Y.—p. 1185.
Dermatitis of Buttocks Due to Saligenin. H. A. Brunsting and L. A. Brunsting. Rochester, Minn.—p. 1187.
Lacquered Hairpins Holding Psycne Knot. Probable Cause of Lichenified Eczema of Scalp. Report of Case. M. H. Goodman. Baltimore—p. 1191.
Ringworm of the Scalp. V. Mechanism of Cure of Infections Caused by Microsporum Linosum. G. M. Lewis and Mary E. Hopper. New York—p. 1194.
Dermatology in Art. L. Goldman. Cincinnati—p. 1197.
Naevus Syringadenomatosus Papilliferus (Werther). Report of Five Cases. W. Sachs. Jersey City, N. J. and G. M. Lewis. New York—p. 1202.
Naevus Acneiformis Unilateralis (Naevus Follicularis Keratosus). Report of Case. A. Sayer. New York—p. 1210.
Arthur Van Harlingen. A Patriarch in American Dermatology. P. E. Bechet. New York—p. 1217.

Reactions to Mapharsen—During the last two years Jordan and Traenkle employed mapharsen as a routine in the treatment of patients who reacted severely to arsphenamines. In most instances mapharsen was employed only for patients who had repeated reactions to one or more of the other arsenicals. The group of patients consisted of "persistent reactors." A total of 154 patients who had reacted to arsphenamines were given 1,126 injections of mapharsen. Of these, follow-up was possible in 110, who had received 1,024 injections. The reactions were gastro-intestinal, nitritoid, cutaneous and postarsphenamine jaundice. Sixty-four patients who had had repeated severe gastro-intestinal reactions were treated with mapharsen.

Of these, fifty-three tolerated the drug well, that is, with little or no further discomfort. In the eleven patients who were intolerant to mapharsen, the reactions appeared shortly after administration of the drug was begun. Twenty patients who had had severe repeated nitritoid reactions from treatment with one or more other arsenicals were given mapharsen and none showed a nitritoid reaction. The drug could be used in full dosage without danger of such a reaction. However, in three of the patients a different type of reaction appeared, in two gastro-intestinal and in one severe headaches. Administration of the drug to these three patients was stopped. Eighteen patients who had had postarsphenamine jaundice (at varying intervals after recovery) were further treated with mapharsen. Of these, sixteen tolerated the treatment well. In the other two jaundice developed in one patient after three injections of 0.03 Gm. and in the other after twelve injections of 0.04 Gm. Both patients had an uneventful recovery when administration of the drug was stopped. Eight patients who had had various types of cutaneous reactions to other arsenicals were treated with mapharsen. Five of the seven patients who had had minor arsphenamine dermatitis tolerated mapharsen well. One who had had severe crustaceous dermatitis was unable to tolerate the drug.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

18 673 736 (Nov.) 1937

- Effect of Heat Applied by Elliott Treatment and Short Wave Diathermy on Blood and Lymph Flow of Intestine and Colon. Experimental Study in the Dog. C. R. Schmidt, J. M. Beazell and A. C. By. Chicago—p. 677.
Experiments with Decimeter Wave Therapy. Martha Brunner Orstein. Vienna, Austria—p. 684.
Physical Therapy of Fibrositis. T. H. Krusen. Rochester, Minn.—p. 697.
Terminology Relating to Medical Hyperthermia. A. Bessmans. Ghent, Belgium—p. 698.
Physical Aspects of Infra Red Radiant Energy in Therapy. W. T. Anderson Jr. Newark, N. J.—p. 699.
Physical Measures in Traumatic and Functional Neuroses. N. H. Polmer. New Orleans—p. 704.
Treatment of Birth Injuries and Related Problems. E. R. Carlson. New York—p. 708.
The Spastic Child. F. H. Ewerhardt, St. Louis—p. 711.

Archives of Surgery, Chicago

35 1031 1208 (Dec.) 1937

- *Nonspecific Mesenteric Lymphadenitis. Report of Seventy Five Cases. S. Rosenberg. Pittsburgh—p. 1031.
Scoliotic Scoliosis. Clinical Analysis of Eighty Cases. M. A. Levine. Los Angeles—p. 1045.
Multiple Peripheral Aneurysms Associated with Nonsyphilitic Degeneration of Tunica Media. W. DeW. Andrus and L. Hellman. New York—p. 1052.
Anhydremia as Factor in Death from Autolytic Peritonitis. G. Iev. Naples, Italy—p. 1074.
Discharges from the Nipple. Their Clinical Significance and Mamographic Interpretation. N. F. Hickel, R. R. Best and H. B. Hunt. Omaha—p. 1079.
*Does Operative Fusion of Tuberculous Joints Produce Tuberculous Meningitis? F. L. Liebolt. New York—p. 1095.
Clinical and Experimental Operations on Gallbladder and Common Duct. Results of Primary Suture. G. L. McWhorter. Chicago—p. 1099.
Thrombo-Angitis Obliterans and Typhus. Evidence of Etiologic Relationship. C. Goodman. New York—p. 1126.
Alterations in Hip Joint After Deafferentation. K. B. Corliss. Stanford University, Calif.—p. 1145.
Malignant Tumors of Meckel's Diverticulum. Report of Case of Leiomyosarcoma. K. K. Nygaard and W. Walters. Rochester, Minn.—p. 1159.
Olfactometry in Cases of Acute Head Injury. P. P. Goland. New York—p. 1173.
Sixty Fourth Report of Progress in Orthopedic Surgery. J. G. Kuhn. E. F. Cave, S. M. Roberts, R. J. Joplin and W. Elliott. Boston.
J. A. Freiberg. Cincinnati. J. E. Milgram. New York and R. I. Stirling. Edinburgh, Scotland—p. 1183.

Nonspecific Mesenteric Lymphadenitis—Rosenberg makes a clinical classification of nonspecific mesenteric lymphadenitis into chronic, acute, acute fulminating and acute suppurative mesenteric lymphadenitis. He discusses the subject from the point of view of (1) diagnosis, which is often obscure, (2) etiology, which is still in doubt, and (3) treatment and prognosis. Diagnosis of the chronic type resolves itself into an elimination of other causes of the presenting symptoms. The acute variety is often confused with acute appendicitis and operation is usually required to decide the issue. Concerning the cause, tuberculin tests indicated that the tubercle bacillus is not the offending organism. Cultures and sections in six glands failed to show evidence of pyogenic or tuberculous infection.

tion There is a definite seasonal incidence, perhaps related to infection of the upper part of the respiratory tract Foci of infection are probably important etiologic factors In twenty-three of the seventy-five cases reviewed, tonsillectomy and adenoidectomy had been done previous to operation, thus eliminating the tonsils and adenoids as a source of infection Of twenty-nine replies to follow-up letters, two thirds of the patients still had abdominal pain after laparotomy Postoperative supportive measures are probably of great value in the alleviation of symptoms

Fusion of Tuberculous Joints and Tuberculous Meningitis—Liebolt points out that during the twenty-three year period from 1889 to 1912, before operative fusions came into use and when all tuberculous patients were treated conservatively, 1,398 persons with tuberculosis were admitted to the hospital, on whom no operations other than aspirations were performed However, 149, or 10.6 per cent, of these patients died of tuberculous meningitis, an average of six and one-half deaths a year During a similar length of time (from 1912 to 1935) when operative fusion was performed there were 1752 patients with tuberculosis admitted to the hospital, on whom 1,941 operations were performed Only twenty-three of these patients, however, died of tuberculous meningitis This is a percentage of 1.3 for patients admitted and 1.1 for operations performed, with an average of one death a year Eight of the twenty-three deaths occurring between 1912 and 1935 were of patients on whom no operations had been performed because of their delicate condition at the time of admission and during their stay in the hospital If these eight deaths were eliminated the percentage of deaths for those patients who were operated on would drop from 1.1 to 0.77 Postmortem examinations were made on all but four of the fifteen patients operated on The diagnosis of tuberculous meningitis was confirmed in each case In only one patient was the fusion definitely solid—a patient with tuberculosis of the spine, in four the status of the joint was not known and in eighteen fusion was not present This, therefore, is evidence that lack of either operative or natural fusion of a tuberculous joint is in many cases a predisposing factor to tuberculous meningitis Surgical intervention in a tuberculous joint does not produce tuberculous meningitis

California and Western Medicine, San Francisco

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- Pseudobiliary Dyskinesia S H Mentzer San Francisco—p 296
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Scleroma in California H E Alderson San Francisco—p 317

Illinois Medical Journal, Chicago

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- Pneumonia in Childhood Etiology and Classification J Brennemann Chicago—p 397
Symptomatology and Diagnosis of Pneumonia in Children W L Crawford Rockford—p 401
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Saddle Nose Report on Use of Ivory and Cartilage Implants S Salinger Chicago—p 412
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Id Bronchoscopic Aspects P H Holinger Chicago—p 431
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Johns Hopkins Hospital Bulletin, Baltimore

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- Lesions of Rectus Abdominis Muscle Simulating an Acute Intra-Abdominal Condition I Anatomy of Rectus Muscle T S Cullen and M Brodel Baltimore—p 295
Id II Hemorrhage Into or Beneath Rectus Muscle Simulating Acute Abdominal Condition T S Cullen Baltimore—p 317
Correlation of Respiratory Quotient to Glycogen Reserves E M Bridge Baltimore—p 349
Presence of Multiple Agglutinins in Serum of Patients with Chronic Rheumatoid Arthritis C W Wainwright Baltimore—p 358

Journal of Allergy, St Louis

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- Studies in Mucous Membrane Hypersensitiveness II Passive Local Sensitization of the Nasal Mucous Membrane H Sherman C Kaplan and M Walzer Brooklyn—p 1
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Therapeutic Value of Iodized Oil in Bronchial Asthma L H Criepp and J A Hampsey Pittsburgh—p 23
Sensitivity to House Dust and Goose Feathers in Infantile Eczema Role of Specific Allergens L W Hill Boston—p 37
Blood Surface Tension Sedimentation Rate and Hypertensive Blood Pressure Responses Following Ingestion of Allergenic Foods C J Sullivan and W T Vaughan Richmond Va—p 48
Scorings in Long Bones as Guide in Management of Food Allergy in Children M B Cohen and S Friedman Cleveland—p 54

Iodized Oil in Bronchial Asthma—Criepp and Hampsey consider the value of iodized oil in the treatment of bronchial asthma through a review of the literature, the treatment of forty cases of intractable asthma and 335 questionnaires Of twenty patients treated by intratracheal insufflation, only three obtained prolonged relief In seventeen cases the treatment was a total failure Of ten patients who received oil following bronchoscopy, only one showed complete relief A group of ten patients treated with iodized oil elsewhere failed to show either clinical improvement or loss of clinical sensitivity to substances to which they were allergic Of the 230 replies received, 166 indicated no experience with this form of treatment and the remaining sixty-four replies revealed the following: 1 Only one third of the physicians who tried this therapeutic procedure are still using it, but, for the most part, only as an adjunct to medical and allergic management in a well selected group of asthma patients 2 In bronchial asthma (267 cases) cure was obtained in 19 per cent, improvement in 247 per cent and failure in 734 per cent 3 In asthmatic bronchitis (thirty-nine cases) cure was reported in 0.8 per cent, improvement in 22.8 per cent and failure in 76.4 per cent The replies further demonstrated a particular lack of enthusiasm if not direct opposition to this form of therapy Untoward reactions to iodized oil are reported by many These reactions may be due to allergy to iodine and poppyseed oil, to circulatory failure, to spread of infection and to damage to pulmonary tissue Fatal reactions are not rare

Journal of General Physiology, New York

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Journal Industrial Hygiene & Toxicology, Baltimore

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- Symptomatology of Chronic Poisoning with Oxides of Nitrogen A A Vigdortschuk E C Andreeva I Z Matussevitch M M Nikulina I M Frumina and V A Svirer Leningrad U S S R—p 469
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Study of Chronic Chest Disease Among Coal Miners in Shotts Scotland J A M Hall Shotts Scotland—p 506

Lead Content of Evaporated Milk.—To determine whether there is any contamination from the tin-lead alloy solder used in sealing cans of evaporated milk, Fairhall obtained samples of milk canned in widely separated sections

of the country. The milk was without exception purchased in retail establishments. Brands peculiar to a given locality were usually chosen in addition to the standard brands. Analytic determinations were made on two 100 Gm samples taken from each can. The two methods used are independent and, of the two, the probability curve for the diphenylthiocarbazon method is the more symmetrical. The study fails to show any correlation between the age of the can of milk and the lead content. Four cans in which solder pellets had been introduced purposely and which had been standing for eight months showed no significant increase in the amount of lead dissolved in the milk. This is a somewhat definite indication that pellets of solder when present in the milk are apparently without significance. Analyses by the photometric method gave an average value of 7.6 micrograms per hundred grams of evaporated milk, or of 0.076 mg per kilogram of milk. The results obtained with the diphenylthiocarbazon method gave an average value of 11 micrograms per hundred grams of evaporated milk, or 0.11 mg per kilogram. On the basis of diluted milk the foregoing figures compare favorably with those obtained by Harwood and Turley on raw milk. It takes approximately 225 parts by weight of ordinary milk to produce 1 part by weight of evaporated milk. On the basis of ordinary milk then the values obtained by the two methods compare favorably with the value obtained by Harwood and Turley for raw milk alone. The presence of spectrographic traces of lead in raw milk has also been reported by Zbinden. Contamination of the product from the solder seal can be said to be of no hygienic significance.

Journal of Lab. and Clinical Medicine, St. Louis

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- Aminopyrine Hypersensitivity J. S. Davis Jr. and L. F. Frissell New York—p. 107
- Guanidine-like Substances in the Blood IV Blood Guanidine in Patients with Parathyroid Deficiency and with Idiopathic Tetany J. E. Andes Morgantown W. Va. and V. C. Myers Cleveland—p. 123
- Experimental Studies on Long Continued Administration of Bismuth Summary Form H. R. Fishback and Dora Fishback Chicago—p. 127
- Mumps Incidence of Palpable Splenic Enlargement and of Complications and Their Relation to Salivary Gland Involvement as Evidence That the Disease Is a Systemic Infection J. A. Greene and R. H. Heeren Iowa City—p. 129
- *Successful Treatment of Persistent Extreme Dyspnea 'Status Asthmaticus' Use of Theophylline with Ethylene Diamine U. S. P. (Aminophylline) Intravenously G. Herrmann and M. B. Aynesworth Galveston Texas with the help of J. Martin—p. 135
- Urinary Iron Excretion Adelaide P. Barer and W. M. Fowler Iowa City—p. 148
- Use of Mercurial Diuretics Case Report with Autopsy Findings F. G. Norbury Jacksonville Ill.—p. 156
- Effect of Staphylococcus Antitoxin on Rabbits Given Broth Cultures of Staphylococci Intravenously R. H. Rigdon Nashville Tenn.—p. 159
- Preservation of Sputum for Pneumococcus Type Differentiation A. H. Harris and F. M. Varley Albany N. Y.—p. 164
- Determination of Platelet Volume I. Olef Boston—p. 166
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- Some Practical Aspects of Routine Performance of the Kahn Test M. Pearl Spawick and R. G. Synder Iowa City—p. 181
- Improved Method for Determination of Urine Urea Nitrogen by Direct Nesslerization W. F. Taylor E. R. Hayes and B. B. Wells Dallas Texas—p. 188
- Rapid Preparation of Tapeworm Proglottids for Diagnostic and Teaching Purposes G. J. Damm New York—p. 192
- Comparison of Urea Methods S. R. Seljeskog and J. W. Cavett Minneapolis—p. 194
- *Serum Volume Test for Hemorrhagic Diathesis in Jaundice F. F. Boyce and Elizabeth M. McFetridge New Orleans—p. 202

Treatment of Persistent Extreme Dyspnea—For the last six years Herrmann and Aynesworth have been using the intravenous injection of theophylline in doses of 0.48 Gm in 10 cc of saline solution for the relief of persistent extreme dyspnea, 'status asthmaticus' and "epinephrine fast" asthma. The solution has been given slowly through a small needle in order to avoid unpleasant reactions. Such reactions, however, have occurred fairly frequently in spite of all precautions but have been only slightly unpleasant and never serious. Most of the patients complain of a momentary feeling of heat in the

skin, particularly of the face, burning in the eyes, sometimes, a sense of constriction in the chest, occasionally nausea and vomiting and in rare instances cerebral manifestations, twitching, convulsion and coma. There have not, however, been any fatalities as a result of the injection of this drug. In the sixteen clinical cases of asthmatic bronchitis or chronic bronchial asthma presenting attacks of status asthmaticus, forty-one injections of theophylline with ethylene diamine have been administered intravenously as emergency therapy, usually with success after epinephrine had been ineffectual. Of these forty-one injections thirty-one afforded prompt, complete and persistent relief, but at least six of these were of the half dosage of 0.24 Gm. In two instances the full dose of 0.48 Gm seemingly failed. Theophylline with ethylene diamine in 0.48 Gm doses diluted to 10 cc and slowly introduced intravenously seems to be a most effective, prompt, reliable and safe therapeutic procedure for the combating of status asthmaticus even after a refractoriness to epinephrine has developed.

Test for Hemorrhagic Diathesis in Jaundice—Boyce and McFetridge outline a test which they are certain is a reliable indication of the bleeding tendency in jaundice. An arbitrary amount of blood, preferably 3 cc, is collected in a graduated tube and allowed to stand at room temperature for four hours, at the end of which time the clot is removed and studied for firmness, retractility and similar characteristics. The serum volume is then read and the index calculated. In a control group of twenty-five nonjaundiced and apparently normal male subjects, with blood counts, platelet counts, coagulation time and bleeding time within normal limits, they found that at four hours the serum volume was equivalent to 50 per cent of the blood volume. The same ratio was maintained in some of their twenty-two jaundiced patients, while in others, notably the patient who furnished them with the clue and who proved the case, as it were, by her frank purpura, the serum volume was decidedly below this level. They therefore developed a serum volume index which equals the serum volume of the patient studied over half the volume of the blood withdrawn for the study. They consider 1 as the standard of normal and consider indexes below this normal as progressively indicative of a tendency to hemorrhage. The retractility of the clot is always related to the level of the index and serves as an additional check. Only one precaution is necessary, a routine blood count to demonstrate a possible anemia. If anemia is present, the serum volume will be greater than half the blood volume and the proper correction must be made when the index is calculated. The use of the serum volume test is suggested postoperatively, after choledochostomy, to determine how long drainage may be continued safely. Often in such cases prolonged drainage is indicated, and yet such patients under such circumstances sometimes develop a tendency to hemorrhage which was not present preoperatively. It is believed that the serum volume test will furnish a reliable index of this new tendency.

Journal of Nutrition, Philadelphia

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- Comparative Nutritive Values of Glucose Fructose Sucrose and Lactose When Incorporated in Complete Diet H. H. Mitchell T. S. Hamilton and Jessie R. Beadles Urbana Ill.—p. 435
- Activatability of Milk as Affected by Feeding Ergosterol to Cows R. F. Light L. T. Wilson and C. N. Frey—p. 453
- Survival of Completely Depancreatized Dog I. L. Chaikoff and A. Kaplan Berkeley Calif.—p. 459
- Environmental Temperature as Factor in Production and in Cure of Rickets in the Rat N. B. Guerrant R. A. Dutcher and Ruth Crowthers State College Pa.—p. 471
- Further Studies on Effect of Excessive Vitamin A on Estrous Cycle of the Rat T. C. Sherwood O. R. Depp G. P. Burge and H. B. Detsch Lexington Ky.—p. 481
- Respiratory Metabolism of Rats Receiving a Diet Deficient in Inorganic Constituents Change in Basal Metabolism M. Kris and A. H. Smith New Haven Conn.—p. 487
- Vitamins A, C and D in Maize as Affected by Variety and Stage of Growth W. B. Esselen Jr. C. R. Fellers and B. J. Arlert Mass.—p. 503
- Effect of Oral Administration of Pancreatin on Fecal Nitrogen R. J. F. Loss in Achylia Pancreatica C. R. Schmidt J. V. Beazell P. J. Crittenden and A. C. Ivy Chicago—p. 513
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Journal of Pharmacology & Exper Therap, Baltimore

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- Effect of Histamine on Salivary Secretion O S Gihls and H H McClanahan Memphis Tenn—p 218
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- Effects of Ether, Chloroform and Cyclopropane on Cardiac Automaticity W J Meek H R Hathaway and O S Orth Madison Wis—p 240
- *Chemotherapy of Experimental Streptococcal Infections of Rabbits with Special Reference to Pyridine Compounds and Prontosil Soluble J A Kolmer H Brown and G W Raiziss with assistance of Anna M Rule and L W Clemence Philadelphia—p 253
- Microscopic Observations of Bronchiolar Reactions T Sollmann and A J Gilbert Cleveland—p 272
- *Sensitivity of Diphtheritic Heart to Digitalis C W Edmunds R G Smith and C A Moyer Ann Arbor Mich—p 286
- Studies on Denervated Kidney III Effect of Ergotamine and Atropine on Uricosuric Effect of Cinchophen G P Grahfield B Prescott and W K Swan Boston—p 293
- Effects of Ingested Lead on Organism I Studies on the Rat M K Horwitt and G R Cowgill New Haven Conn—p 300
- Action of *p*-Aminophenol on Certain Tissue Oxidations F Bernheim Mary L C Bernheim and H O Michel Durham N C—p 311
- Hydrolysis of Acetanilid by Various Tissues H O Michel F Bernheim and Mary L C Bernheim Durham N C—p 321

Chemotherapy of Experimental Streptococcal Infections—Kolmer and his collaborators believe that the purpose of the chemotherapy of septicemia and especially of the surgical types due to infection with streptococci and staphylococci should be not only disinfection of the blood by the promotion of phagocytosis and bactericidal action but likewise and even more importantly, disinfection of the primary and secondary local infections of the fixed tissues so likely to be present. For this reason they believe that experimental septicemia induced by local infection is particularly applicable for chemotherapeutic investigation and that, in rabbits employed in their study, it has appeared quite helpful since the influence of the compounds employed may be directly observed clinically along with cultures of the lesions and blood for evidences of disinfection as compared with untreated controls. Since septicemia due to hemolytic streptococci is usually due to a rapid overflow of organisms into the blood from a primary infection of the fixed tissues which cannot be effectively balanced by the clearing mechanism, the primary purpose of treatment is to provide adequate drainage whenever possible supplemented by such biologic and chemotherapeutic measures as will aid disinfection of the fixed tissues, the blood and the clearing mechanism. Particularly encouraging results have been observed with two pyridine compounds containing an amino group or an amino group with iodine and especially with 2-2' pyridyl sulfide dihydrobromide, since the effects have been similar to those observed with "prontosil solution" in similar amounts per kilogram of weight. From a comparative study of compounds having a pyridine nucleus with those having a benzene nucleus, it would appear that the former offers greater possibilities than the latter and particularly when containing divalent sulfur in the molecule.

Sensitivity of Diphtheritic Heart to Digitalis—To study the increased sensitivity of the diphtheritic heart to digitalis, Edmunds and his associates injected a large series of guinea pigs with a small dose of toxin and after five days gave the animals four-fifths the minimal lethal dose of strophanthin or of tincture of digitalis. The results were not conclusive probably because the intoxication had not progressed far enough, the animals being active, running around the pen in spite of an average loss of 12 per cent of body weight. There was a slight increase in susceptibility toward strophanthin but apparently not to digitalis, although the difference in mortality between those receiving toxin and the normal controls was not significant. Ten cats were injected subcutaneously with 0.005 cc. of diphtheria toxin per kilogram of body weight and after a few days when they showed definite signs of illness but were still in fair condition the lethal dose of digitalis was determined. The cats were anesthetized with urethane given intraperitoneally and the standard digitalis powder in the form of a 0.5 per cent infusion was injected intravenously at a

uniform rate. On the basis of the original weights of the cats, the minimal lethal dose of digitalis for the toxin series is 65 per cent of the dose required by the normal animal and on the basis of the weight at the time the digitalis test was carried out it was 74 per cent, clearly demonstrating the increased susceptibility of the digitalis heart over the normal organ. The minimal lethal dose of the cats with cardiac irregularities is about 75 per cent of the dose for the diphtheritic animal having normal rhythm. The observations are in harmony with the statement of von Koss that full dosage of digitalis is to be avoided in cases of conduction injury, as the drug possesses a peculiar affinity for the conducting system and if this system is damaged by the toxin a therapeutic dose of digitalis may produce a complete block from a latent one.

Michigan State Medical Society Journal, Lansing

36 805 924 (Nov.) 1937

- *The Diabetic Problem as Influenced by Protamine Insulin E P Joslin Boston—p 819
- *Migraine A Disorder of the Sympathetic Nervous System W H Riley Battle Creek—p 831
- Toxic Hepatitis R C Connelly Detroit—p 839
- Ocular Symptoms and Signs of Brain Tumor C S O'Brien Iowa City—p 844
- Incidence of Seizures in Families of Extramural Patients with Epilepsy L E Himler Ann Arbor—p 846
- Cannabis Sativa W H MacCracken Detroit—p 848
- Intranasal Administration of a Pertussis Antigen S S Schooten Detroit—p 849
- Autogenous Vaccines in Hay Fever W C Beben Lansing—p 852

The Diabetic Problem as Influenced by Protamine Zinc Insulin—Joslin points out that protamine zinc insulin has probably increased the number of diabetic patients using insulin in the United States by 70 000. This has come about not because of what doctors have said concerning it but because diabetic patients generally recognize the value of insulin, and the simplicity of taking it only once a day has encouraged many to use it who avoided it heretofore. The fact that during the brief period of one or two years the number of insulin users has increased so much demonstrates that the problem of the management of diabetes in this country is changing rapidly. And there is good reason for this change. The rising incidence of diabetes in the United States is due first of all to the more systematic search for diabetic patients and the closer medical supervision of the population in general, secondly, many more people now live beyond the age of 40 years, when the onset of diabetes is twice as frequent as it is in the interval between birth and 40 years, thirdly, diabetic patients live much longer than they used to. Two other factors may be the changing diet and the lessened participation in muscular work. One of the commonest errors is to expect results from protamine zinc insulin within the first few days of administration. A diabetic patient has twenty years or more ahead of him and one need not hurry. It is safer to proceed slowly. One must allow time for it to act and actually more time is demanded to change a patient who has been living on regular insulin to protamine zinc insulin than is necessary to start a fresh patient on protamine zinc insulin.

Migraine A Disorder of the Sympathetic Nervous System—In addition to the fundamental and essential condition (inherited functional disorder of the sympathetic nervous system) of migraine Riley mentions the following: (1) the relation of age to attacks of migraine (2) the fact that among the exciting causes may also be mentioned depressive emotions, such as those associated with worry, anxiety, fear and anger, fatigue, exhaustion, loss of sleep, eye strain, errors of refraction, excessive use of the eyes, using the eyes in a bright light, (3) sensitization to certain foods and certain toxins, (4) increased alkalinity of the blood and (5) a spasm or contraction of the arteries in the meninges and cortical centers of the large brain. The immediate cause of the pain is the contraction and spasm of the meningeal arteries, which pinch the sensory nerves in the walls of the meningeal arteries. The spasm of the arteries supplying blood to the different cortical centers is undoubtedly responsible for many of the other symptoms associated with the headache, such as temporary blindness, homonymous hemianopia, aphasia, temporary loss of sensation and temporary motor paralysis of certain parts of the body.

The attacks of severe vertigo which frequently accompany an attack of headache are undoubtedly due to a spasm of the arteries and a change in the circulation in the labyrinth and vestibular apparatus and connecting neural pathways of the internal ear

New England Journal of Medicine, Boston

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- The Clinical Aspects of Ectopic Pregnancy J Rock Brookline Mass —p 765
Hydatidiform Mole and Chorionepithelioma L E Phaneuf, Boston —p 770
Abortion J R McCord Atlanta Ga —p 776
Treatment of Chronic Alcoholism R Fleming Boston —p 779
Criteria for Diagnosis of Coronary Disease P D White Boston —p 783

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- Fever Therapy H C Solomon and I Kopp Boston —p 805
Physiologic Principles in Treatment of Anemia W Dameshek Boston —p 815
Suction Pressure Therapy in Peripheral Vascular Disease E E O Neil Boston —p 828
The Wisdom of the Human Body R C Cabot Cambridge Mass —p 833

New Jersey Medical Society Journal, Trenton

34 649 710 (Nov) 1937

- The Union County Medical Society President's Address Oct 13 1937 E P Weigel Plainfield —p 653
The Academy of Medicine Its Educational Value to the Doctor and the Public M Danzis Newark —p 655
Cancer Control Organized Plan for Coordinated Action in a General Hospital A R Casilli Elizabeth —p 660
Plastic Repair an Aid in Therapeutic Nasal Surgery A M Mamlet Newark —p 664
Practical Results of Modern Cancer Research The Second Harrison Stanford Martland Lecture of the Essex County Anatomic and Pathologic Society J Ewing New York —p 667
The Physician and His Prescriptions Pharmaceutical Article Number Two C I Ulmer Gibbstown and R P Fischelis Trenton —p 673
Missed Abortion Maternal Welfare Article Number Twenty One C H Ill Newark —p 675
Address of Welcome to the American Hospital Association Atlantic City Monday Sept 13 1937 W G Herrman Asbury Park —p 676

New York State Journal of Medicine, New York

37 1891 1970 (Nov 15) 1937

- Spinal Anesthesia Its Use and Limitations O C King Philadelphia —p 1891
Role of Acute Infection in Hypertensive Cardiac Failure J R Lisa and A Ring New York —p 1895
Mantoux Test in Pediatrics Increased Significance and Importance to the General Practitioner Report of 1000 Cases J Battaglia and F L Rosen Brooklyn —p 1901
Analgesia and Anesthesia in Obstetrics Pentothal Sodium Cyclopropane and Vinyl Ether W Bourne Montreal —p 1905
Telangiectases of the Brain Stem Associated with Obstructive Hydrocephalus and Mental Deterioration C Davison and C Rosenheck New York —p 1909
Bed Rest for Back Injuries E T Wentworth Rochester —p 1914
*Tannic Acid Therapy in Allergy of Nasal Mucosa H A Abramson New York —p 1919
Autotransfusion in Ectopic Pregnancy A J Wallingford Albany —p 1922
Clinical Evaluation of Tertiary Butanol Hydrogen Peroxide as a Fungicide F C Combes New York —p 1927
Treatment of Industrial Burn J J Wittmer Brooklyn —p 1931
Diphtheria of the Skin I Pincus New York —p 1938

Tannic Acid Therapy in Allergy of Nasal Mucosa—Abramson has used 0.5 per cent tannic acid in certain types of allergic rhinitis since 1935. The response of the normal mucous membrane to tannic acid varies. The same statement is true of allergic patients with various types of nasal complaints. A patient may refuse to use the tannic acid because of sneezing and irritation, in these cases it is to be discontinued. On the other hand, there are some individuals who use it continuously and find it in no way objectionable. It may be advisable in certain instances to use a higher concentration if the low concentration is well borne but there is only slight clinical improvement. In that event a 1 per cent solution may be prescribed. The patient should preferably use the solution with an all glass nebulizer and spray his nose from two to three times a day, depending on his reaction. Tannic acid does not agglutinate ragweed pollen or coagulate pollen protein with the same facility that it causes precipitation of other proteins or cells. Tannic acid has the remarkable property of sensitizing the surfaces of bacteria and red cells for phagocytosis. It is, perhaps, by a mechanism related to this

surface action on unicellular organisms that a protective process may have been set up in the nasal mucosa in the instances in which relief was afforded in the cases yielding to this form of therapy

Public Health Reports, Washington, D C

52 1563 1598 (Nov 5) 1937

- General Aspects and Functions of the Sick Benefit Organization R R Sayers Gertrud Kroeger and W M Gafafer —p 1563
*Treatment of Psoriasis with Massive Doses of Crystalline Vitamin D and Irradiated Ergosterol Preliminary Report E T Ceder and L Zon —p 1580
Pulmonary Tumors in Mice IV Lung Tumors Induced by Subcutaneous Injection of 1 2 5 6 Dibenzanthracene in Different Mediums and by Its Direct Contact with Lung Tissues H B Andervert —p 1584

52 1599 1638 (Nov 12) 1937

- Protracted Incubation in Malarial Fever Report of Case and Review of Literature B Mayne —p 1599

Treatment of Psoriasis with Vitamin D—While Ceder and Zon were employing massive doses of vitamin D, averaging 300,000 units daily, in the treatment of a series of cases of chronic arthritis, a complete involution of a widespread chronic psoriatic process occurred in a patient afflicted with both conditions. This suggested further application, and since April 1936 they have so treated fifteen cases of chronic widespread psoriasis, in three the process was distributed over the entire body. All the patients were between 30 and 50 years of age. Two were women and thirteen were men. In all cases the psoriasis had existed for several years, in some as long as twenty years, and was resistant to numerous remedies and without conspicuous spontaneous involution. Those who were being treated during the summer months were protected from natural sunlight radiation as much as possible. Each patient received orally from 300,000 to 400,000 units of irradiated ergosterol (vitamin D). Eleven patients showed a complete involution within from six to twelve weeks, two obtained only partial improvement within ten weeks of observation and two showed no benefit. The capsules were taken between meals. There were no untoward reactions during the course of treatment, with the exception of three individuals who developed the suggested evidence of hypervitaminosis D, characterized by anorexia, nausea, malaise and urinary frequency after from ten to twelve weeks of treatment. However, they had obtained their benefit by that time and treatment was about to be discontinued. These reactions were mild and caused no alarm or disability. Recurrences have occurred. Only one of the group of those who had a recurrence has been subjected to a repeated course of treatment. He has experienced two such attacks after an approximate interval of freedom of from two to three months, but the process was limited to the scalp on the first and second recurrences. He obtained equally good results by a repeated course of treatment in from eight to ten weeks.

Rhode Island Medical Journal, Providence

20 169 188 (Nov) 1937

- Ophthalmic Reaction to Tryparsamide in Treatment of Neurosyphilis W M Muncy Providence —p 169
The Modern Treatment of Neurosyphilis H E Kiene Providence —p 174

Texas State Journal of Medicine, Fort Worth

33 409 478 (Oct) 1937

- Modern Trends in Diagnosis and Medical Treatment of Lobar Pneumonia M D Levy Houston —p 414
Serum Therapy in Lobar Pneumonia W H Potts Dallas —p 418
*Ray Therapy in Treatment of Pneumonia F T McIntire and J H Smith San Angelo —p 422
Roentgen Rays in Diagnosis and Treatment of Pneumonia E V Powell Temple —p 427
Physiotherapy in Treatment of Pneumonia J W Torbett Jr Marlin —p 432
Surgical Complications and Sequels of Pneumonia J W Dickey Dallas —p 437
Incidence of Pneumococcal Types in Dallas Analysis of 340 Cases C B Sanders Dallas —p 442
Postpneumonic Sequels in the Chest W W Watkins Phoenix Ariz —p 443
Geriatrics as a Modern Specialty W S Horn Fort Worth —p 447
Pregnancy at Term in a Rudimentary Horn of a Bicornate Uterus Internal Migration of a Fertilized Ovary with Unusual Development Anomalies M E Barrett Fort Stockton —p 453
New Growths of Air and Upper Food Passages A F Clark Antonio —p 457
Detachment of the Choroid W S Webb Fort Worth —p 460

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2 949 1004 (Nov 13) 1937

- Carcinoma of the Stomach J Morley—p 949
Mastoid Operations W Howarth and G Bateman—p 954
*Disseminated Focal Pneumonia J G Scadding—p 956
Varix of the Neck H S Barber—p 959
Carcinoma of the Ureter Report of Case A Lyall—p 961
Spontaneous Subarachnoid Hemorrhage Report of Case A Karmally with notes on postmortem findings by K D Manobar—p 962
*Reexpansion of Atelectatic Lower Lobe and Disappearance of Bronchiectasis G H Jennings—p 963

Disseminated Focal Pneumonia—Scadding encountered four cases of acute or subacute pulmonary infection which seem to form a recognizable clinicoröntgenologic group, important because of the unusual and possibly prolonged course and the resemblance of the x-ray changes to those of pulmonary tuberculosis. The clinical and x-ray evidence suggests that the pulmonary lesion in these cases was essentially a pneumonia in small foci disseminated through lobes or parts of lobes of the lungs and liable to enter on a phase of delayed resolution. There arises the concept of a process characterized by pneumonic consolidation in small scattered foci, the individual foci at any time may be of different ages and at different stages of evolution toward resolution, organization or suppuration. They may clear almost completely or may leave more or less residual fibrosis. The process shows little of the tendency to a clear-cut termination seen in the more usual types of pneumonia, and may enter a subacute or chronic phase. If a case presenting this picture comes to necropsy, there will be little that is striking to the pathologist except the focal distribution of the lesions, the main interest of the picture is clinical. The symptoms differed clinically from those of other forms of pneumonia in several respects. The onset was not sudden, as in lobar pneumonia, and there was no evidence of a previous descending infection of the respiratory tract. The initial symptoms were mostly constitutional—malaise, headache, sweating and shivery sensations short of an actual rigor. Cough, at first dry, subsequently became productive of increasing amounts of purulent sputum, reaching a maximum after several weeks and continuing thereafter according to the progress of the case. Defervescence occurred in the fourth or fifth week, and symptoms, especially cough and sputum, continued for another week or two. The physical signs were most evident over the upper lobes in two cases and over the lower lobes in two. They consisted of moderate impairment of percussion note, weak breath sounds and numerous fine to medium rales. No definite consolidation signs were detected. Roentgenologically the picture consisted of areas of diffuse, rather coarse mottling, in foci varying from about 2 to 5 mm in diameter. These changes were confined to the left upper lobe in one case and affected parts of more than one lobe in the rest. Resolution was slow in all but one case, in which it was not complete for at least twelve weeks from the onset. The resemblance of the infiltration to that of tuberculosis was at times striking. The most remarkable feature of the bacteriology of the sputum in these four cases was the absence of organisms usually associated with pneumonia. Only organisms that might be found in any respiratory tract were isolated. The etiology remains obscure. The existence of the syndrome calls for caution in the application of collapse therapy in cases in which pulmonary tuberculosis of acute onset is suspected on x-ray grounds without confirmation from bacteriologic examination.

Reexpansion in Atelectasis—Jennings cites a case in which, in the course of an attack of acute bronchitis, with probable small areas of bronchopneumonia, an atelectasis of the lower left lobe developed. This possibly was due to plugging with secretion of the bronchioles in that lobe during a time when movements of the left lung were restricted owing to pleuritic pain. At all events, when sputum was coughed up later the lobe reexpanded. In this process it was assisted by respiratory exercises. A cylindric dilatation of the bronchi developed within the collapsed lobe. With reexpansion of the lobe the bronchi became of normal width. The lobe was collapsed for about a month. The case illustrated the pos-

sibility that bronchial dilatation in atelectatic lobes may disappear if the lobe reexpands. For this reason it is urged that methods for promoting early reexpansion of atelectatic lobes should be employed. Among these, postural and bronchoscopic drainage, inhalation of carbon dioxide and respiratory exercises have all been used with success. Not until such methods have been tried and the permanence of the atelectasis proved should lobectomy be considered.

East African Medical Journal, Nairobi

14 219 248 (Oct.) 1937

- Direct Injection of Lungs for Treatment of Pulmonary Tuberculosis J R Roberts—p 221

Edinburgh Medical Journal

44 669 732 (Nov.) 1937

- Survey of Volhard's Views on Hypertension and Hematogenous Bilateral Kidney Diseases R H Goetz—p 669
Clinical Recollections and Reflections XVIII Diagnosis D M Lyon—p 685
Harvey and the Human Heart H Yellowlees—p 695
*Seasonal Variation in Tuberculosis as Illustrated in Study of Body Temperature and Body Weight C Clayton—p 707

Seasonal Variation of Temperature and Weight in Tuberculosis—Clayton avers that a seasonal fluctuation of body temperature is noticed in tuberculous patients who are observed for one or more complete years. Febrile disturbances of varying degrees are more common during February, March and April than at other times of the year. This change is more pronounced in adult women than in adult men. The change is observed also in tuberculous children. Seasonal variation occurs in the body weight of tuberculous patients, there being a tendency to lose weight during the late winter and early spring and a tendency to gain weight during the autumn and early winter. This trend would appear to be more pronounced in female cases. In children there is a period of slow growth in weight during the spring and early summer and of very rapid growth in weight during the late summer and early autumn. In adult patients the seasonal variation in weight bears a definite relationship to the amount of systemic disturbance. If the systemic factor is so pronounced as to cause rapid wasting no seasonal change in weight is likely to be observed. In cases in which toxemia is slight but persistent, a well defined diminution in weight is apparent during February, March and April. In milder cases in which the systemic factor is slight and transient there is no decline in weight during the spring, but the gain in weight which is usually noted in these cases is temporarily interrupted. In cases in which the systemic factor is absent and the increase in weight is rapid, no seasonal trend is apparent.

International Journal of Psycho-Analysis, London

18 373 504 (Oct.) 1937

- Analysis Terminable and Intermittent S Freud—p 373
The Problem of the Genesis of Psychic Conflict in Earliest Infancy Remarks on a Paper by Joan Riviere R Walder—p 406

Journal of Laryngology and Otology, London

52 731 802 (Nov.) 1937

- Pathology and Treatment of Carcinoma of Bronchus F C Ormerod—p 733
Air Cells of the Petrous Portion of the Temporal Bone J G Wilson J P Gaardsmoe and B J Anson—p 746

Journal of Tropical Medicine and Hygiene, London

40 257 376 (Nov.) 1937

- Spermatogenesis and Fertilization in *Phlaenus Spumarius* Fallen A Robert and A J Gibbs—p 257
Filarial Periodicity C Lane—p 262
*Second Note on Infectivity to Man of Strain of *Trypanosoma Rhodesiense* Resistance of Two African Volunteers to Infection J F Corson—p 263
Diagnosis of Skin in Negroes L J A Idoewenhal—p 266

Infectivity of Man to Strain of *Trypanosoma Rhodesiense*—Corson describes experiments on four African volunteers in connection with the transmission of a strain of *Trypanosoma rhodesiense* maintained in sheep and antelopes since October 1934. The strain of *Trypanosoma rhodesiense* has been maintained from the beginning solely by cyclic transmission by *Glossina morsitans* and only through ruminants. Two of the four volunteers resisted infection. The trypano-

cidal action *in vitro* of the blood serum of three of the volunteers on this strain of trypanosomes was tested in 1936 by Fairbairn. Two isolated *Glossina morsitans* flies were used, and each was fed twice on a resistant volunteer and afterward infected another volunteer. Neither of the resistant volunteers showed a local skin reaction, while the infected volunteers showed local swelling. The infections in white rats that were bitten by these two flies before and after the dates on which the volunteers were bitten were similar and indicated no change in the virulence of the trypanosomes in either of the flies during their infective life. It seems that the two resistant volunteers were more resistant than the other two, and this suggests that in nature many persons are bitten by infective flies without becoming infected. Cases of inapparent infection may not be of rare occurrence and some infected people may recover spontaneously. It would be interesting if similar experiments with a suitable strain of trypanosomes were made on volunteers in Europe to see whether, like African natives, some are resistant. In such experiments the question of inapparent infections has to be considered.

Lancet, London

2 1005 1060 (Oct. 30) 1937

The Problem of Assessing Psychiatric Treatment as Illustrated by a Follow Up of Eighty Three Patients Seen at a General Hospital D. Curran—p. 1005

Nutrition Surveys Vitamin A Deficiency Among School Children in London and Cambridge M. K. Maitra and L. J. Harris—p. 1009

Mycosis Fungoides D. Embree B. Portnoy—p. 1015

Ketoneuria in Infancy C. H. Gray—p. 1017

*Pharmacologic Actions of Sulfanilamide F. Hawking—p. 1019

Pharmacologic Actions of Sulfanilamide—In studying the pharmacologic action of sulfanilamide, Hawking observed that a solution of 1:1,000 was completely inert, thus it had no action on the intestine of the rabbit or uterus of the guinea pig suspended *in vitro* at 37° C, or on the heart of the frog perfused through the inferior vena cava. A cat, anesthetized with sodium barbiturate, was given intravenously 0.17 Gm of the drug per kilogram of body weight in 15 per cent solution, and no effect could be observed on the blood pressure, similarly with a dog that also received 0.17 Gm per kilogram of body weight. It has no trypanocidal action *in vitro*, trypanosomes withstanding a concentration of 1:400 for twenty-four hours at 37° C. In the light of these results, further investigations were made by administering very large doses to animals and observing the symptoms produced. Injections were made intraperitoneally, and they appeared to cause no irritation. Of ten rabbits, one received 0.4 Gm per kilogram of body weight and showed no symptoms, two received 1 Gm and one showed moderate symptoms, two received 1.5 Gm and both showed marked symptoms, five received 2 Gm and two of these died. Of two cats which received 2 Gm per kilogram of body weight, one died after three days. The symptoms when shown were weakness of the legs, dyspnea, panting, general appearance of decerebrate rigidity and the like. Animals which survived were killed after a week and their organs were examined histologically. The liver, kidneys and other viscera showed no change due to the sulfanilamide. In three animals, which died from the drug, the central nervous system was examined, degenerative changes—e.g., chromatolysis—were observed in the neurons of the anterior column of the spinal cord and in some of the neural cells of the cortex and midbrain. The symptoms suggest that in acute poisoning by large doses of sulfanilamide the stress falls mainly on the central nervous system, apart from the dyspnea which is presumably due to the formation of sulfhemoglobin. The symptoms described have little significance for human therapy, since they were obtained only by the use of large doses, and although at one stage the animals appeared completely prostrated, most of them subsequently made a dramatic recovery.

Medical Journal of Australia, Sydney

2 813 826 (Nov. 6) 1937

Tuberculosis in Australia. N. J. Holmes—p. 813

Some Comparative Aspects of Tuberculosis in Lower Animals L. B. Bull—p. 827

Pathogenesis and Prophylaxis of Pulmonary Tuberculosis C. Harvey—p. 831

Chronic Myocarditis R. Whistow—p. 837

Bull. et Mém. de la Soc. Méd. des Hôpitaux de Paris

53 1377 1444 (Nov. 29) 1937 Partial Index

Acute Aleukemic Leukosis Simulating Erythema Nodosum and Terminating in Gangrene of the Penis R. Kourilsky, A. Beauvy and P. Anglade—p. 1378

*Cardiovascular Disturbances in Myxedema R. Froment and M. Jeune—p. 1406

Suprasellar Cholesteatoma J. Dereux, E. Hartmann and J. Le Beau—p. 1422

Syndrome of Intracranial Hypertension of Syphilitic Origin Cured by Specific Treatment J. Dereux, L. Coustenoble and S. Desreumaux—p. 1426

*Acriflavine in Treatment of Cerebrospinal Meningitis R. Puig—p. 1429

Cardiovascular Disturbances in Myxedema—Froment and Jeune report three cases which throw light on the principal aspects of the cardiovascular disturbances for which myxedema is responsible. First they give their attention to cardiac hypertrophy in patients with myxedema (myocardiac myxedema). They cite the clinical history of a woman who developed cardiac hypertrophy and the typical signs of myxedema following a hemithyroidectomy. The patient was treated with thyroxine and under the influence of this treatment the myxedema as well as the cardiac enlargement disappeared. The authors point out that such cases are not unusual but that among seventy-two patients with myxedema in whom cardiac measurements were made fifty-two were found in whom the transverse diameter of the heart was above the normal maximum. As the characteristic aspects of the cardiac hypertrophies for which myxedema is responsible the authors list (1) the development in the course of myxedema and the parallelism between the degree of myxedema and the augmentation of the cardiac volume, (2) the elective therapeutic action of thyroid extracts, (3) the remarkable moderation of the signs of cardiac insufficiency in comparison with the considerable augmentation in the cardiac dimensions, (4) the electrocardiographic aspects which reveal an extremely low voltage of the electric complexes and a veritable disappearance of the T wave and (5) the inertia of the heart indicated by the feeble amplitude of the contractions. The authors further discuss, on the basis of another case history, the low voltage of the electric complexes in myxedema and then give their attention to angina pectoris and myxedema. Following a brief review of the literature they report the history of a man who for a while had been subject to attacks of angina pectoris. Hypertension without albuminuria had been observed during the same period. After two years of treatment with vasodilating measures the angina pectoris gradually improved, but signs of myxedema developed. When attempts were made to counteract the symptoms of myxedema by means of thyroxine there was a recurrence of attacks of angina pectoris. Other cardiovascular disturbances that may occur in patients with myxedema are cardiac insufficiency, disturbances in the cardiac rhythm, arterial hypertension and atheromatous lesions of the arteries. The value of total thyroidectomy in cardiac disorders is discussed.

Acriflavine in Treatment of Cerebrospinal Meningitis—Puig reports the history of a child, aged 8, who was first subjected to intramuscular and intraspinal injections of polyvalent antimeningococcal serum. When after weeks this serotherapy proved ineffective, an intraspinal injection of 7 cc of a 1:20,000 solution of acriflavine was administered and from this day on the child was given at first every day and then every second day intravenous injections of a 5:1,000 solution of acriflavine. Under the influence of this treatment the child recovered, and the author suggests that acriflavine might have a similar effect on meningococci as on gonococci. He directs attention to the fact that the intraspinal injection of acriflavine is accompanied by violent burning sensations in the region of the buttocks, the anus and the legs but that these last for only a minute or two and there are no other complications.

Mémoires de L'Académie de Chirurgie, Paris

63 1247 1278 (Nov. 24) 1937 Partial Index

Ascending Angiocholitis After Hepaticogastrostomy Its Exclusion by Operation of Mallet-Guy (Pyloric Exclusion) G. Leclerc—p. 126

*Suture of Abdominal Wall with Aid of Buried Steel Wire Dambrin—p. 1269

Suture of Abdominal Wall with Buried Wires—Dambrin shows the advantages of the use of steel wire for ligating the abdominal wall, which the author commenced to

employ thirty-two years ago. Like Jeannel the author employs a wire about 0.3 mm in diameter, if it were finer, it would injure the tissues, if stronger, it would be difficult to tie. The technic is simple. In describing the suture of the wall after a subumbilical laparotomy, the author says that he closes the surgical opening in two layers, the deeper one with steel wire comprises the peritoneum and the muscular aponeurosis, and the upper, cutaneous one, is closed with clips, which can be removed on the seventh day. The buried steel suture is never the originating point of pain. In extremely emaciated patients the steel knots may be slightly perceptible under the skin, but this is not disagreeable for the patient. The wire is never eliminated if it has been well sterilized. In exceptional cases a suppurating hematoma may form and it may be necessary to extract one or two wires, but after that cicatrization is completed. The author used the buried wire suture also in hysterectomies for cancer of the uterus or for adnexitis. He emphasizes that the buried wire sutures are well tolerated.

Schweizerische medizinische Wochenschrift Basel

67 1105 1124 (Nov 20) 1937

- *Infantile Paralysis Without Paralysis Abortive Form of Meningitic Poliomylitis E. Wieland—p 1105
Analeptics and Sport R. Staehelin—p 1113
Ganglions of Menisci R. Meyer Wildisen—p 1114

Abortive Form of Meningitic Poliomylitis—Wieland reports that local epidemics of poliomyelitis developed in different parts of Switzerland between the early summer and November of the year 1936. In all, 1,270 cases were reported by physicians. The clinical and epidemiologic behavior varied greatly, but on the whole the course was unusually benign. In the children's clinic in Basel twenty-six cases of poliomyelitis were treated and there was not a single fatality. Nineteen of the cases were hospitalized between the second and fifth days of the disease, with high fever and with the symptoms of the so-called meningitic form of poliomyelitis. All these patients recovered completely without developing paralytic symptoms in the course of several weeks. However, all patients passed through a more or less severe muscular weakness, which was preceded by anomalies in the reflexes. Such cases of "infantile paralysis without paralysis" or of the abortive form of the so-called meningeal type of poliomyelitis have been described before, to be sure, sometimes under the misleading term of aseptic serous meningitis. The author points out that these cases seem to be everywhere on the increase and thinks that they indicate that the character of the epidemics of poliomyelitis becomes milder. Whether certain noncharacteristic, febrile infections without signs of nervous irritation, which develop in persons who come in contact with poliomyelitic patients (so-called contact cases), belong to the sphere of abortive poliomyelitis has not been definitely decided as yet. It is likewise difficult to estimate whether the surprisingly favorable therapeutic results are due to the benign character of the disease or to the early treatment with convalescent serum, parent's blood and large doses of sodium salicylate. Observations on cases in which the treatment was begun later seem to indicate that both the benign character of the disease and the early onset of the serotherapy were the cause of the favorable results. Regarding the control of poliomyelitis epidemics the author says that, in addition to early therapy and isolation of the patient, it is important to watch the healthy members of the patient's family, for the virus seems to be transmitted less often by direct contact than by indirect contact through healthy intermediate carriers to susceptible young persons.

Folia Medica, Naples

23 1095 1150 (Oct 30) 1937

- *Alterations of Medullary and Peripheral Blood in Chronic Nephritis A. M. Michelazzi and S. De Renzi—p 1097
Treatment of Paroxysmal Tachycardia with Quinine and Analeptics by Intravenous Route A. Francavilla—p 1116
Action of Vitamin E and of Liver Hormone on Hemopoietic Changes Induced in Rabbits by Acetanilid and Neutral Lead Acetate C. Colella—p 1124

Alterations of Blood in Chronic Nephritis—Michelazzi and De Renzi studied the morphology and hemocytometry of the peripheral and medullary blood of nineteen patients who were suffering from glomerulitis in different stages of evolution. The medullary blood was taken by puncture of the

sternum. The authors found that in all cases there is anemia of the hypochromic type, alteration of the chemical and physical properties of the blood, diminished size of the erythrocytes of the peripheral and medullary blood and hypoplasia of the bone marrow for all the blood-forming cells, especially erythrocytes. Anemia parallels the intensity of renal insufficiency and the alterations of the chemistry of the blood. Microcytosis depends on erythropoietic malformations and on the incapacity of the cells to regenerate owing to the presence of chemical and physical alterations of the blood. Hypoplasia of the bone marrow depends on the inhibition of erythropoiesis due to the presence of aromatic and toxic substances in the blood. The more intense the renal insufficiency, the greater the accumulation of toxic substances in the blood and the consequent inhibition of erythropoiesis. The alterations of the bone marrow as well as the modifications in the size of the diameters of the erythrocytes are characteristic changes of chronic nephritis.

Policlinico, Rome

44 533 592 (Nov 1 1937) Medical Section

- *Roentgen Calculations of Volume of Sella Turcica G. Meldolesi and E. Pansadoro—p 533
Aromatic Substances in Nephropathies L. Supino—p 546
Oxygen Therapy Influence on Basal Metabolism and Erythropoiesis S. Sellina Gualco—p 577

Roentgen Method of Calculating Volume of Sella Turcica—Meldolesi and Pansadoro report a roentgen method for determining the capacity of the sella turcica in living persons. The capacity of the sella equals the product of the multiplication of the figures of the lateral surface of the sella by those of the transverse diameter. The lateral surface is determined by Haas's method in the laterolateral projection. The transverse diameter is the length of a horizontal line at the base of the quadrilateral portion of the sphenoids which forms the back of the sella. It is determined in the sagittal position with a particular incidence. The authors use an adjustable tube in relation to the forward inclination of the patient's head with the patient seated. The roentgenograms are taken at a focal distance of 2 meters. They show the shadow of the back of the sella turcica directly projecting through the occipital foramen, on a space between the posterior margin of the occipital foramen and the arch of the first cervical vertebra. The authors made determinations in twenty-five living persons of both sexes, at different ages, and verifications of their studies on fourteen skulls. The volume of the normal sella turcica varies from 800 to 1,250 cu mm for adults and from 500 to 800 cu mm for children between 9 and 12 years of age. The figures of the transverse diameter of the normal sella compensate those which are given by the anteroposterior and vertical diameters of the sella turcica when the latter figures are diminished, in comparison with those regarded as normal. The figures for the volume obtained by x-ray measurements on the skulls closely agree with those obtained in living persons. The x-ray measurements give a difference of 10 or 15 per cent loss in square millimeters in comparison to the real measurements of the sella turcica. This was verified by direct measurements on paraffin copies of the sella turcica. Owing to the natural structure of the sella turcica, the method is not of mathematical exactness since the concavities in the sella appear as surfaces in the roentgenograms. It cannot be applied to measuring sella turcicas of abnormal contours. The evaluation of the sella turcica by the volumetric method gives more exact figures than those given by the measures of the sellar surface alone or by those of the sellar diameters.

Riforma Medica, Naples

53 1541 1580 (Oct 30) 1937

- Syndromes of Hyperfunction of Liver N. Pende—p 1543
*Dehydrogenation Power of Leukemic Leukocytes for Fatty Acids G. Bossa—p 1545
Pinkus Exudative Lymphatic Erythrodermia. C. Maderna—p 1549

Dehydrogenation Power of Leukemic Leukocytes for Fatty Acids—According to Bossa the leukocytes in leukemia have powers of dehydrogenation for fatty acids and produce keto acids. Homogeneous suspensions of leukemic leukocytes in the presence of Quastel's sodium glycerophosphate solution

of fatty acids consume more oxygen and produce a larger quantity of acetic acid than the same suspensions which do not have any fatty acids. The most intense dehydrogenation takes place for the crotonic and palmitic acids. The largest production of acetic acid by the leukocytes takes place in the presence of crotonic acid. Leukemic lymphocytes have greater dehydrogenation and acetic acid-forming properties than leukemic myelocytes. The last mentioned properties of the leukocytes are the same in chronic and subacute forms of leukemia. The production of acetic acid is not proportional to the quantity of oxygen consumed in the reaction. It is possible that the ketonic acid, as it is produced in the reaction transforms itself through reduction into hydroxybutyric acid or through oxidation into terminal products. Fatty acids may also diminish in the reaction through transformation of monobasic into dibasic acids by processes of oxidation of the terminal methyls according to Verkade's ω oxidation.

Archiv fur Gynakologie, Berlin

165 1134 (Oct 20) 1937 Partial Index

- Neurohormone Regulation of Renal Function During Pregnancy as Demonstrated in Water Test G Effemann—p 1
Experimental Studies on Physiology and Pharmacodynamics of Uterine Tubes C Cella and I D Georgescu—p 36
Peculiar Changes on Vessels of Umbilical Cord W Rust—p 58
*Vitamin C Tolerance Tests in Nursing Puerperal Women G Gaetgens and E Werner—p 63
Clinical Significance of Crural Fractures in the New Born J Erbsloh—p 76
Duration of Birth and Its Dependence on Climatic and Geographic Influences K Nordmejer—p 95

Vitamin C Tolerance Tests in Nursing Mothers—Gaetgens and Werner made tolerance tests with cevitic acid on nursing puerperal women. They studied the vitamin C content of the milk and determined the existing vitamin C deficit. The milk of a high percentage of the nursing mothers had a vitamin C content that was inadequate for the requirements of the nursing. The authors detected a dependence of the cevitic acid content of the mother's milk on the quantity of cevitic acid that was given in addition to the food. The oral administration of 100 mg of cevitic acid increased the vitamin C content of the milk in only a small percentage of cases. However, the intravenous administration of 300 mg of the vitamin provided an adequate elimination of cevitic acid in the breast milk. The authors discuss the significance of these observations for early lactation and for adequate provision of the nursing with vitamin C.

Zeitschrift fur Kinderheilkunde, Berlin

59 129 248 (Oct 14) 1937 Partial Index

- *Interposition of Colon Abdominal Pains During Childhood A Windorfer—p 129
Contribution to Problem on Food Requirements of Premature Births Josefine Tanz and Helene Unger—p 135
Aspects of Acute Erythremic Myelosis of Nursing Age (a Typical Erythroblastic Disease) F Teclazic—p 141
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Interposition of Colon During Childhood—Windorfer points out that interposition of the colon has been repeatedly observed in adults but has not received attention in the pediatric literature. He demonstrates that this disorder has theoretical and practical interest during childhood. The disorder consists in a misplacement of the colon between the liver and the diaphragm. The case reported concerns a girl, aged 8. The child was subjected to a pulmonary roentgenoscopy because a tuberculin test had been positive. The child had been unsuccessfully treated for abdominal pains, which dated back more than four years. The first roentgenogram of the lung disclosed an accumulation of air under the right diaphragmatic arch. Repeated roentgenography revealed that this air space was comparatively large. The hepatic resistance could not be felt on palpation. Roentgenography following a contrast meal

finally disclosed the interposition of the colon between the liver and the diaphragm. It was decided that this condition was responsible for the abdominal pains, from which the child had suffered for years. In the differential diagnosis of this disorder conditions like umbilical colic, appendicitis, helminthiasis and ileus have to be considered. The treatment is rather unsatisfactory. The acute attack requires the use of spasmolytics and heat. Aside from restricting bloating foods and those with large amounts of cellulose, dietetic measures are unnecessary. The muscles, particularly those of the abdomen and the back, should be strengthened by suitable gymnastics.

Phosphorus Fractions of Erythrocytes During Anemia

—Kinzel says that, in view of the fact that erythrocytes contain phosphate esters, it seemed advisable to study their behavior in anemias. She summarizes as follows: 1 In anemias produced by venesection in rabbits, the anorganic and the esterized phosphorus in the blood as well as the esterized phosphorus in the erythrocytes decrease parallel with the hemoglobin and erythrocyte values. 2 In animals in which anemia was induced by the intravenous injection of phenylhydramine the esterized phosphorus of the erythrocytes showed in two out of three cases a behavior that was opposite to that of the hemoglobin and the erythrocytes, as these values decreased the esterized phosphorus increased. Hydrolysis revealed in the two animals an increase of the hexosephosphate and of the glycerophosphate fractions of the entire acid soluble phosphorus in the blood. In both animals a reticulocytic crisis developed as an indication of a beginning cure, in spite of further measures to increase the anemia. The esterized phosphorus of the erythrocytes revealed a tendency to increase, together with the onset of the regeneration. 3 Observations on anemic children revealed that the esterized phosphorus in the whole blood decreases as the anemia increases, whereas the behavior of the anorganic phosphorus seems to follow no definite rules. However, the esterized phosphorus in the erythrocytes increased as the anemia advanced. In accordance with the depot theory, the decrease in the esterized phosphorus of the blood is thereby restricted. 4 As the esterized phosphorus of the erythrocytes increases, the phosphoric acid esters that are difficult to hydrolyze, the glycerophosphate and the hexosephosphate, increase in relation to the volume of the erythrocytes. This increase involves both fractions with changing severity. 5 The readily hydrolyzable phosphoric acid ester, the pyrophosphate, decreases relatively as well as absolutely as the esterized phosphorus in the erythrocytes increases. 6 Studies on the anemic children did not disclose a relation of the fluctuations in the esterized phosphorus to those in the reticulocytes. It therefore remains an open question whether, as was indicated by the animal experiments, the increase in the esterized phosphate is a phenomenon of regeneration.

Zeitschrift fur Tuberkulose, Leipzig

78 305 426 (Sept) 1937 Partial Index

- Open Treatment of Tuberculous Cavity H Kleesattel—p 303
*Tuberculous Pachymeningitis O Koch—p 318
Technic of Filling of Upper Lobe and of Plastic Operation on Upper Lobe W Kremer—p 331
*Silent Superinfection in Tuberculosis G Weber and F Dusch—p 336
Perforation of Paravertebral Abscess into Lung H Poindecker—p 347

Tuberculous Pachymeningitis—Koch cites reports from the literature which indicate that tuberculous pachymeningitis is an accompanying process of the tuberculosis of adjoining organs and develops by contact. However, he observed still other forms of pachymeningitis. In this paper he gives his attention chiefly to the relations between tuberculous pachymeningitis and tuberculosis of the brain on the one hand and tuberculous inflammation of the dura on the other. There is reason to assume that tuberculosis of the pachymeninges may develop after that of the leptomeninges, simultaneously with it and even before. That is, there is an independent hematogenous metastasizing, tuberculous process of the dura mater. The author differentiates three types. First he mentions the interstitial tuberculous pachymeningitis, which develops by contact infection. He points out that the most frequent form of this type, the fine nodules that accompany tuberculous leptomeningitis, has been described before, particularly by Huebner.

who emphasizes that this form of nodular tuberculosis of the dura is not found in all cases of tuberculous leptomeningitis. It is often absent in new tuberculous basal meningitis. To be sure, it is difficult to say in what stage of advancement the leptomeningitis must be in order to produce an infection in the dura. In the second type of tuberculous pachymeningitis which the author observed the dependence on tuberculous processes of the leptomeninges is possible but not proved. In discussing this type, he gives three case reports. In two of the cases there existed, in addition to the changes in the dura also numerous solitary tubercles of the brain but in the third case they were absent. The third type of tuberculosis of the dura which the author describes is the independent hematogenic metastasis. In one of the case histories which he cites in connection with this type, the brain could be lifted from the two large tubercles of the dura without loss of substance. The corresponding portions of the brain showed depressions that were entirely smooth and were still covered with the pia mater. Thus it cannot be said that the tuberculomas had been torn from the brain and only adhered to the dura. To be sure there also existed a tubercle in the substance of the brain, but this was nowhere in contact with the surface, so that it could not elicit an infection of the dura and of the leptomeninges. Consequently the author regards the tuberculomas of the dura as independent hematogenic metastases caused by the same dissemination as the tubercle in the brain itself. He further cites a case in which there existed a tubercle only of the dura, all other parts of the brain being entirely free from tuberculosis. Finally the author cites a form of tuberculosis of the meninges that developed in the course of a primary tuberculosis of a child. In this case the microscopic examination disclosed extensive changes in all layers of the dura and also in the leptomeninges.

Silent Superinfection in Tuberculosis—Weber and Dusch point out that the influence of tuberculous superinfection is still rather obscure. It is almost impossible to determine whether a newly developing tuberculous focus is the result of a superinfection or of an endogenous metastatization. In experiments on guinea pigs he made the following observations: 1 The subcutaneous infection with a human strain of tubercle bacillus of weak virulence produces an isolated primary complex without generalization. 2 The intracutaneous infection with from fifty to 100 bacilli of a virulent bovine strain produces a large tuberculous primary focus, a severe caseation of the regional lymph nodes as well as an extensive generalization in the internal organs. 3 Animals that were given a preliminary treatment with one strain of tubercle bacilli and then were superinfected with another strain showed no macroscopically demonstrable changes at the site of superinfection. Nevertheless, microscopic examination always disclosed characteristic changes at this site. Following a review of the observations made by other investigators, the author shows that superinfection often gives at first the impression of an isolated involvement of the lymph glands. Since the site of superinfection frequently remains unrecognized, the condition is referred to as "silent superinfection." Further the author compares the results of the experimental studies with the natural infection in human subjects and reaches the conclusion that the two are in accord. He thinks that the results of a superinfection are chiefly tuberculosis of the bronchial lymph nodes and its sequels, perihilar infiltrations and hematogenic disseminations. He emphasizes that the animal experiments as well as the clinical observations demonstrate that it is absolutely necessary to protect tuberculous children, particularly nurslings and small children, against a superinfection.

Wiener klinische Wochenschrift, Vienna

50 1539 1570 (Nov. 12) 1937 Partial Index

Artificially Produced Cutaneous Tuberculosis in Treatment of Severe Pulmonary Tuberculosis H. Kutscher Aichberger Ctd—p 1544

*Henry's Malaria Reaction and Its Relation to Complement Titer and to Takata Reaction W. Volavsek—p 1551

*Experiences with Radium Therapy in Bleeding Myomas O. Bittmann—p 1552

Relations Between Henry's Malaria Test, Complement Titer and Takata Reaction—Volavsek studied the behavior of Henry's test on male and female patients who received maternal treatment for gonorrhea. Control tests were made

on disorders such as dermatoses, gonorrhea, syphilis, chancroid tuberculosis, arthritides, pneumonia, carcinoma, hepatic diseases and so on. In summarizing his experiences he says that Henry's malaria reaction always becomes positive in the course of a vaccination malaria. It becomes positive at the earliest after the third and at the latest after the sixth attack. The control tests revealed nonspecific positive reactions in disorders with impairment of the hepatic parenchyma and in tuberculosis, carcinoma and syphilis. In the patients undergoing malaria therapy and in whom Henry's reaction was strongly positive, the complement reaction and the Takata reaction gave positive results. The author concludes that an increase in the instability of the serum is of decisive influence for the positive outcome of Henry's reaction.

Radium Therapy for Bleeding Myomas—Bittmann reports experiences with radium irradiation in sixty-four cases of uterine myoma that were complicated by severe hemorrhages. In thirty-five of the cases only curettage had preceded the application of radium. The curettage was done for diagnostic purposes. Some of the women had been treated previously by organotherapy, balneotherapy or other measures. After classifying the cases according to the size of the myomas, the author discusses the dosage. He says that in two cases of large myomas he applied 2,800 millicurie hours but admits that the result was disappointing. He reaches the conclusion that large myomas are not suitable for radium therapy. However, in surveying the results of radium therapy in fifty-nine patients with smaller myomas, he finds that they are surprisingly favorable. He stresses as an advantage of intra-uterine radium therapy the prompt cessation of the hemorrhage as the result of the direct ray action. A disadvantage is that the intra-uterine radium therapy cannot be used in case of large myomas, of submucous myomas or of the large intramural myomas. In the submucous myomas there is danger of necrosis and in the presence of the large intramural myomas a homogeneous irradiation of the uterine cavity is impossible. He concludes that intra-uterine radium therapy should be resorted to in those cases of bleeding myomas in which a considerable anemia exists but in which the growths are at the most the size of a goose egg. Moreover, only women who are past the menopause or at least near it should be subjected to this treatment.

Nederlandsch Tijdschrift v Geneeskunde, Amsterdam

51 5583 5658 (Nov. 20) 1937 Partial Index

Pseudosyphilis Papulosa Lipschutz and Posterosive Syphilitic (Jacquet) W. L. L. Carol—p 5586

*Is There a Tropical Syphilis? C. W. Bottema—p 5593

Syndromes of Still Chauffard Ramond and Feltz T. J. Bloem S. Van Creveld F. C. Kuipers and P. J. Zuidema—p 5601

*Tryptophan Reaction in Cerebrospinal Fluid W. A. Griep—p 5612

Is There a Tropical Syphilis?—Bottema presents a comparison that was made between 321 cases of recent syphilis in Asiatic and 770 cases in European subjects, all military men of the Netherlands royal navy, all well cared for and well nourished and not in a position to conceal their disease to any appreciable extent. This investigation and a study of the literature of the last five years led to the following conclusions:

1 Primary and secondary syphilis in Europeans and Asiatics run an analogous course. 2 Congenital and the other forms of syphilis occur in Asiatics as well as in Europeans. 3 As concerns the ethnologic groups of the East Indian Archipelago, racial factors exert no influence worth mentioning on the course of syphilis. 4 The picture which till the present was designated as 'tropical syphilis' can be explained on the basis of one or more of the following factors, which have nothing to do directly with syphilis or with race: (1) confusion between yaws and syphilis, (2) conclusions drawn from observing a one-sided material of native patients attending the dispensaries of the Western pattern, which conclusions do not hold for the total population, (3) the result of neglect, lack of care and of efficient treatment and (4) the influence of a poor general physical condition no matter of what cause.

Tryptophan Reaction in Cerebrospinal Fluid—Griep points out that in 1932 Lichtenberg suggested a color reaction with tryptophan as a diagnostic test for tuberculous meningitis. He mentions other authors who employed this test and then describes his own experiences with the method. He made the

test on the cerebrospinal fluid of fifty patients with various disorders and found that the tryptophan color reaction is always positive when the protein reactions are positive. He says that the reaction cannot be considered a specific test for tuberculous meningitis.

Norsk Magasin for Lægevidenskapen, Oslo

98 561 897 (June) 1937 Partial Index

- *Fifty Cesarean Sections in Placenta Praevia L. S. Petersen—p. 600
- Pathogenesis of Gastric Ulcer Surgeons' Experiences N. Paus—p. 623
- Surgical Treatment of Bronchial Asthma Extirpation of Stellate Ganglion R. Ingebrigtsen—p. 638
- *Total Gastrectomy with Esophagojejunostomy Seven Cases J. Holst—p. 672
- *Investigations on Etiology of Lymphogranulomatosis Especially Relation Between Lymphogranulomatosis and Tuberculosis G. Lützow Holm—p. 695
- *Primary Cavernous Hemangioma in Parotid Gland G. Guldberg—p. 756
- *Cancer of Vater's Papilla Review of Material of Cases of Cancer of Vater's Papilla from Rikshospitals' Pathologic Anatomical Institute from 1900 to 1936 Experiences from Cases of Cancer of Vater's Papilla in Which Radical Operation was Performed F. Roscher—p. 777
- *Tumors Originating from Carotid Glands R. Ström—p. 845

Cesarean Section in Placenta Praevia—Petersen states that the results of fifty cesarean sections in placenta praevia at the Women's Clinic in Bergen show that the procedure is superior to other forms of treatment in saving the life of the fetus and does not expose the mother to greater risks. With expectant treatment, 17 per cent of the children died, after bringing down a foot, 75 per cent, and after cesarean section, 4 per cent. Three fourths of the children who survived after cesarean section were practically at full term, while only one of seven who were alive after bringing down a foot was at full term. Cesarean section is recommended in cases of placenta praevia when grave bleeding is present or threatens. If the hemorrhage does not seem grave, expectant treatment is in order, eventually with rupture of the membrane. If the hemorrhage is grave and the mouth of the uterus closed, cesarean section is indicated. If the mouth of the uterus is open to two or three fingers, cesarean section competes with bringing down of a foot and pulling on it, if the child is dead or not viable, the hemorrhage can be stilled as effectively by this method and, if the child is living and viable, cesarean section is done even with open mouth of the uterus. In cases of infection or of preceding intravaginal or intrauterine intervention, cesarean section must often be avoided even if the child is viable.

Total Gastrectomy with Esophagojejunostomy—Holst's seven patients had roentgenologically established tumor tissue practically from the cardia to the esophagus, in some cases to a considerable degree adherent to the surrounding tissue. Six of the patients had cancer and one a general polyposis of the stomach with profuse bleeding. In two cases spinal anesthesia was used, in three, ether, in two, combined ether and spinal anesthesia. With general anesthesia Trendelenburg's position is advised. The abdominal wall was opened by a left-sided diarectal incision carried upward 3 cm above the costal arch. The esophagojejunostomy was an end to side anastomosis. The suture line was covered with parietal peritoneum from the diaphragm, which was affixed to the jejunal suture line with silk-knot sutures. Two and a half years after the operation the patient with polyposis has gained 8 Kg, is in good condition and can work, one of the cancer patients is living after fifteen months and has gained 10 Kg. Neither has developed anemia, although no antianemia medication is used. One patient died postoperatively, one a year after operation from metastases, and four died from four to six months after operation from metastases or recurrence. The nutrition absorption of the intestinal canal was only slightly affected after gastrectomy.

Lymphogranulomatosis and Tuberculosis—Lützow-Holm reports eighteen cases of lymphogranulomatosis and asserts that the study of specimens from these patients by systematic inoculation in guinea pigs and attempted cultivation and establishment of tubercle bacilli testify against the tuberculous origin of lymphogranulomatosis. The frequent coincidence of the two disorders mentioned by some authors was

not present in his material, only one case showing simultaneous tuberculosis. He attributes the tuberculosis, which in some cases is produced in guinea pigs by inoculation with lymphogranulomatosis, to a secondary deposit of tubercle bacilli in the lymphogranulomatous tissue and considers it possible that a secondary invasion of this kind may explain the "positive" inoculations elsewhere. He concludes that lymphogranulomatosis and tuberculosis are no more related to each other than are, for instance, leukemia and tuberculosis.

Primary Cavernous Hemangioma in Parotid Gland—Guldberg says that only four cases of this disorder have been reported. In his case the tumor, in the left parotid gland, was visible when his patient was 3 months old and grew rapidly during the first months, then slowly. Attempted surgical removal when the patient was 40 months old was unsuccessful because the tumor adhered to adjacent tissue. Three roentgen treatments resulted in its disappearance, and one year after treatment ended there is no recurrence. Microscopically there was the typical picture of a primary cavernous parotid hemangioma, interspersed with islands of parotid tissue with atrophic changes. The angioma tissue represented all stages of development and all transitions from compact areas with newly formed vessels (some of which might be mistaken for hypertrophic parotid tissue) to distended blood-filled cavernous vessels with projecting septums, the so called spur formation.

Cancer of Papilla of Vater—In 8,724 necropsies there were forty-nine cases of cancer in the bile ducts, in five of which the cancer developed from Vater's papilla or its immediate neighborhood. In the case described, in a man aged 55 duodenopancreatectomy was done. Roscher says that in the first session cholecystogastrostomy was carried out, after which the jaundice which had been present for a long time disappeared. Two months later, when the patient's condition had improved considerably, resection of the duodenum and the head of the pancreas was performed, with ligation of the ductus choledochus, implantation of the pancreatic duct in the jejunum and retrocolic gastroenterostomy of the greater curvature. The operation and after-treatment were uneventful and the patient's condition greatly improved. He died five months later from bronchopneumonia, after having for some time had pain in his chest and a cough, probably due to metastases.

Tumors Originating from Carotid Glands—Ström reports two cases of tumor in the carotid glands, a disorder which, he says, has not previously been described in Norwegian literature, in women aged 45 and 29. The tumors, which were wholly resistant to radiation therapy, were of typical alveolar, "glomus-like" structure with benign clinical course. Seven years and one year, respectively, after radical surgical removal the patients are well, but have postoperative defects, in the first case a complete unilateral peripheral hypoglossal injury, in the second, similar hypoglossal injury and symptoms in the upper right extremity of a left-sided brain molition, due to ligation of the common carotid artery. The author says that about 250 cases of these predominately benign tumors in the neck have been reported. In surgical treatment the mortality is from 25 to 30 per cent, the postoperative morbidity about 50 per cent and often of a lasting kind. The most dangerous complications are molition of the brain and pneumonia after injury of the vagus, each one of which caused death in from 10 to 15 per cent of all cases in which operation was performed. Postoperative lesions of the sympathetic, hypoglossal and recurrent nerves also are frequent. Improvement on the results of treatment depends on a better preoperative diagnosis of the exact location of the tumor and of the conditions of circulation in the carotid artery. By roentgenologic arteriography and by test compression of the common carotid artery the possibility of radical operation with ligation of the carotid without danger of molition of the brain can be determined. If the test compression is not well borne, prolonged intermittent preoperative compression treatment must be instituted to develop the collateral circulation, which alone can protect the brain from deleterious effects of ligation of the carotid. Radical removal of every carotid tumor as early as possible is called for, but further growth leads to complications from the nerves of the brain.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 110, No 3

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CHICAGO, ILLINOIS

JANUARY 15, 1938

THE USE AND INTERPRETATION OF TESTS FOR LIVER FUNCTION

A CLINICAL REVIEW

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For twenty years or more clinicians, physiologists and clinical pathologists have attempted to devise procedures or tests that would indicate the functional capacity of the liver, in order to determine the presence and degree of disease of the liver and to obtain information with regard to prognosis. The careful physiologic studies that have been made following total and partial hepatectomy have served as a guide to the solution of this problem and have stimulated interest in it. Meanwhile, physiologists repeatedly have warned that no one function could be depended on to indicate the general status of the whole organ and that the reserve function of the liver was so great that functional abnormalities could be expected to appear only when most of it had been destroyed. In presenting the following report, it is our intention to consider the utility and general significance of the tests in common use and to place a minimum of emphasis on the theoretical and other phases of the problem. Only the clinical aspects of the subject and reliability of the tests from the standpoint of observed pathologic changes will be considered. The material comprises several thousands of the various tests performed within a period of about five years on the medical and surgical patients of the Mayo Clinic and its allied hospitals. References to the voluminous literature on the subject have been largely omitted and those interested in the physiologic aspects of the various procedures are referred to the excellent reviews by Soffer¹ and by Rich.²

SERUM BILIRUBIN

Just as determinations of values for the blood urea or nonprotein nitrogen are the most useful and reliable methods of determining the functional efficiency of the kidney, so does the determination of the value for the serum bilirubin provide useful information with regard to the functional status of the liver. The earlier work of Mann, Bollman and Magath³ on hepatectomized animals indicated that the liver acts as an excretory organ with respect to bilirubin just as the kidney does

for urea. On this basis it is possible to attribute increases of serum bilirubin to three general types of disturbances which act singly or in combination: (1) those in which bilirubin is produced in excess of the capacity of the liver to excrete it (hemolytic jaundice), (2) those in which the rate of production is not increased but because of toxic or infectious injury to the liver cells and finer bile passages bilirubin accumulates in the blood stream (hepatogenous jaundice), (3) those in which obstruction to the larger bile passages causes a reflux of bilirubin into the blood (obstructive jaundice). As Rich² has argued, the presence of increased amount of bilirubin in the blood because of excess production of bilirubin does not depend on this fact alone but depends in part on an associated disturbance in the excretory function of the liver cells. Actually, the argument can be carried further and extended to prove that pure forms of one or the other types of jaundice are probably rare. There is never gross obstruction to the extrahepatic bile passages without injury to the hepatic parenchyma, conversely, there is never a pure hepatic form of jaundice without injury or obstruction to the finer bile passages. One may however say that jaundice is preponderantly hemolytic, hepatogenous or obstructive, depending on whether one is dealing with a blood dyscrasia, a lesion of the hepatic parenchyma or a lesion which obstructs the flow of bile in the extrahepatic duct system; this conception of the three distinct varieties of jaundice, while technically objectionable, is of too great clinical usefulness to be discarded.

The Thannhauser-Andersen⁴ modification of van den Bergh's original method has been used in our determinations; the report gives the total bilirubin present and its reaction (direct or indirect). For practical purposes it may be considered that the bilirubin ordinarily present in the serum gives the "indirect" reaction and may exist in amounts varying from 0.1 to 2.0 mg per hundred cubic centimeters, according to the method of determination. In hemolytic icterus and in the hemolytic anemias, the excess of bilirubin is apparently "bound" in the blood stream and is not eliminated by the kidney. It gives an indirect reaction and the total quantity rarely exceeds from 6 to 7 mg per hundred cubic centimeters of serum. Whether this indicates an impairment in liver function is not entirely clear, although associated visible hepatic injury of significant degree is rarely demonstrated. However, if the value for the indirect-reacting bilirubin reaches a level of more than 4 mg per hundred cubic centimeters of serum it may be safely assumed that the function of the cells of the liver has been at least functionally impaired.

From the Division of Medicine (Dr. Snell) and the Division of Clinical Pathology, Section on Pathology (Dr. Magath), the Mayo Clinic.
¹ Soffer, L. T. Pre-ent Day Status of Liver Function Tests. *Medicine* 14: 185-254 (May) 1935.
² Rich, A. R. The Pathogenesis of the Forms of Jaundice. *Bull. Johns Hopkins Hosp.* 47: 338-377, 1930.
³ Mann, F. C., Bollman, J. I., and Magath, T. B. Studies on the Physiology of the Liver. I. The Formation of Bile Pigment After Total Removal of the Liver. *Am. J. Physiol.* 69: 393-409 (July) 1924.

⁴ Thannhauser, J. S., and Andersen, E. Methodik der quantitativen Bilirubinbestimmung im menschlichen Serum. *Deutsches Arch. f. Klin. Med.* 137: 179-186, 1921.

If the serum shows the presence of a direct-reacting bilirubin it is practically conclusive proof of injury of the liver and rupture of bile capillaries. In other words, the bilirubin which is taken out of the blood serum as a result of physiologic or mechanical obstruction is being reabsorbed through lymphatic channels while a part at least may pass back into the circulation through the polygonal cells of the liver.

If the van den Bergh test is carefully performed as a ring test instead of a "mixture" test, one may often detect a direct reaction even though there is only the slightest increase in the total amount of bilirubin in the serum. This is an important point which has not been generally recognized. There is no doubt that the presence of direct-reacting bilirubin has some quantitative relation to the function of the liver, that at a certain point the functional or pathologic changes become so great that the cells of the liver are forced to return some of the pigment, in this way high values for indirect-reacting bilirubin tend to give way to the presence of a direct-reacting bilirubin. This is typically seen in jaundice due to arsphenamine, in which the van den Bergh reaction is indirect at first but later is direct.

As a practical matter, one may expect direct van den Bergh reactions in about 80 per cent or more of cases in which there is even a moderate degree of hepatic injury, while one may expect a direct reaction in only about 1 per cent of all cases in which there is an absence of clinical evidence of injury of the liver. A point which has been overlooked is the fact that in serums which give a direct reaction there is also a varying amount of indirect-reacting bilirubin and hence in studying jaundiced patients better correlations might be had if one could determine the amount of both types of bilirubin present, rather than considering that all bilirubin was of the "direct" type. Numerous investigators, for example Heilmeyer and Krebs⁵ and Bengolea, Velasco Suarez and Raices,⁶ have indicated that this separation can be made and that the direct-reacting fraction is smaller than one might anticipate. Biphasic reactions therefore probably represent conditions in which there is little direct-reacting bilirubin as compared with the amount of the indirect-reacting pigment.

In clinical practice, one encounters indirect reactions in the following conditions: pernicious anemia, familial hemolytic jaundice, acute hemolytic anemia, sickle-cell anemia, paroxysmal hemoglobinemia, transfusion of the wrong type of blood, phenylhydrazine poisoning, cardiac decompensation (especially in the presence of gross pulmonary infarction), hemolytic septicemia, malaria, blackwater fever, lobar pneumonia and icterus neonatorum. It is important to recall that these conditions as a rule are associated with a typical acholuric jaundice and that deep jaundice and high values for bilirubin are rarities unless the liver also is injured.

Direct-reacting bilirubin is present in the serum under the following conditions: various types of toxic or infectious jaundice, chronic parenchymatous disease of the liver, mechanical obstruction to bile ducts by tumor, stone, cicatrix, infectious lesions or extrinsic pressure, or tumors, granulomas, cysts and other lesions involving the liver substance. The relative depth of jaundice in these various types of cases may be noted here. The highest values for serum bilirubin (from

30 to 50 mg per hundred cubic centimeters) are found in acute severe hepatogenous forms of jaundice and in neoplastic biliary obstruction, intermediate values (from 10 to 30 mg per hundred cubic centimeters) are found in the milder degrees of hepatic parenchymal lesions and in conditions in which intermittent or partial biliary obstruction exists, the lower grades of bilirubinemia (from 2 to 10 mg per hundred cubic centimeters in the presence of a direct van den Bergh reaction) are found in subsiding acute "intrahepatic" jaundice, in very chronic forms of hepatitis such as those which sometimes follow biliary obstruction or prolonged intrabiliary infection, and in the various forms of portal cirrhosis and syphilitic hepatitis, in the presence of a stone in the common bile duct, and in infectious forms of cholecystitis without gross biliary obstruction.

Having determined the reaction of the patient's serum to the van den Bergh test and the degree of bilirubinemia, one has still to consider the practical problem of the daily variations of jaundice, since the condition is rarely static. This may be done by the continued use of the tests which have been mentioned or by the comparison of the color of the serum with that of a standard solution of potassium dichromate, in order to determine the so-called icterus index. The results of the last method, while not strictly comparable to the results of chemical determination of bilirubin, may be clinically useful. Plotted as a curve⁷ such determinations may be of some diagnostic and prognostic value. In complete biliary obstruction due to neoplasm, a rapidly rising curve is the rule, especially if the gallbladder has been previously removed or has been rendered nonfunctioning by local disease. If the organ is intact, the abrupt rise is converted into a slow and gradual one. If obstructive biliary cirrhosis supervenes, as is so frequently the case in the presence of stricture or stone in the common bile duct, a low plateau curve is the rule, if the liver is not extensively affected, as is the rule in recent neoplastic obstruction, a high plateau curve results, later, a gradual fall in the value for the bilirubin may occur. Studies on dogs which had been subjected to experimental ligation and section of the common bile duct demonstrated an interesting parallelism to these observations. In any large group of cases of jaundice one recognizes certain other types of curves which are clinically significant. Acute "intrahepatic" forms of jaundice produce a rapid rise and an equally rapid fall in the values for the bilirubin, the longer the peak values are maintained, the slower is the decline. In chronic parenchymatous disease of the liver low irregular curves are the rule, exactly as they are in cases of long-standing biliary obstruction, in either instance, episodes of rapid degeneration of liver tissue may be marked by sustained rises in the values for the bilirubin. In general, falling curves for the values for bilirubin signify restored patency of the bile passages or a liver that is undergoing repair, the one exception is the very chronic type of biliary obstruction. High or rising values, as a rule, signify complete obstruction, a rapidly degenerating hepatic parenchyma or a combination of the two.

DETERMINATIONS OF UROBILIN AND UROBILINOGEN

The bilirubin which enters the intestinal tract is acted on by bacteria to form urobilinogen, this is ordinarily returned to the liver and utilized in the formation of

5 Heilmeyer Ludwig and Krebs Willy. *Spektrophotometrische Untersuchungen des Ehrlich-Proscherschen Bilirubin-Azofarbstoffes und ihre praktische Anwendung besonders zur quantitativen Bestimmung des Bilirubins im Blutserum*. Biochem. Ztschr. 223: 352-364, 1930.
6 Bengolea A. J., Velasco Suarez C. and Raices A. E. *El dosage de la bilirubina directa e indirecta en el suero sanguineo. Su importancia en erugia hepato-biliar*. Prensa med. Argentina 23: 83-102 (Jan. 8) 1936.

7 Snell A. M. *Hepatic Parenchymal Lesions and Hepatic Function of Patients with Obstructive Jaundice*. Tr. Am. Gastro-Enterol. Assn. 1933, pp. 196-223.

normal body pigments. In the presence of hepatic injury this resynthesis may be halted and urobilinogen therefore may be excreted in the urine. If the bile passages are completely obstructed, no bilirubin reaches the bowel and consequently no urobilinogen can be formed. Because of the difficulty of making quantitative determination of urobilin and urobilinogen in urine and feces, the use of this knowledge as a test for hepatic function has not enjoyed widespread use. A limited amount of information, however, can be gained by single qualitative or crude quantitative tests for the presence of these substances in the urine. Urobilin is not excreted as such in the urine but may be demonstrated by exposing the urine to sunlight, either direct or diffuse, when any urobilinogen will be converted to urobilin. Indeed, if the presence of urobilinogen is to be detected by ordinary means the urine must be very fresh. Therefore it is best to convert all the urobilinogen into urobilin and determine the latter quantitatively. In neoplastic obstruction to the bile passages there is usually an absence of urobilinogen in the urine, but bilirubin is present, while, in hepatogenous jaundice, urobilinogen and bilirubin are both present. In hemolytic icterus, even though the urine contains no bile pigment, urobilinogen is present. During the course of epidemic or catarrhal jaundice an interesting phenomenon is observed only at the beginning and at the end of the disease is urobilinogen found, probably because during the height of the course of the disease there is sufficient injury to interrupt the continuity of the finer bile passages.

In general, as Watson⁸ has shown, much more conclusive information with regard to urobilin and urobilinogen metabolism can be obtained by quantitative studies of the fecal and urinary excretion of these substances during definite test periods, such studies, while hardly applicable for general use, show that the amounts of bilirubin entering the intestine and therefore the quantity of urobilinogen formed from day to day vary considerably and thus render single examinations of the urine of doubtful diagnostic significance.

There is one interesting recent development with regard to a product of hemoglobin destruction which is affected by disease of the liver. It has been shown that some forms of coproporphyrin are excreted by the kidney in excess when the liver is injured, the same substance may accumulate in the liver during periods of biliary obstruction and may be excreted in the bile as obstruction is relieved. Further investigations along this line may result in additional methods of studying hepatic function with respect to porphyrin metabolism.

TESTS DEPENDING ON THE GENERAL PROPERTIES OF THE LIVER WITH RESPECT TO INTER- MEDIARY METABOLISM

Protein Metabolism—The effect of total hepatectomy on the metabolism of certain protein derivatives is of theoretical interest as Bollman, Mann and Magath⁹ have shown. The removal of the liver is followed by a rapid fall in the concentration of the urea in the blood, urine and tissues, which indicates that the formation of urea has ceased. Amino nitrogen accumulates at the same time but the increase is masked because of the absorption of these substances

by muscular tissues. In the dog there is a rise in the uric acid content of the tissues and body fluids, and the tolerance to injected uric acid is reduced. A partial hepatectomy, or Eck fistula, does not produce changes of the same degree and therefore one would hardly expect that significant alterations could be noted in the ordinary case of disease of the liver. In animals which have been subjected to experimental ligation of the common bile duct, in occasional cases of obstructive jaundice or, more commonly, in cases of acute yellow atrophy, there may be a fall in the concentration of blood urea and nonprotein nitrogen, but any other defects in protein metabolism are difficult to demonstrate. Earlier studies of nitrogen partition in the urine revealed some minor changes in intermediate protein metabolism in cases of liver disease, in one case studied at the Mayo Clinic there was evidence of decrease in the formation of urea and increase in amino acid nitrogen content of both blood and urine. These values returned to normal as the patient improved but were of insufficient magnitude to be of much clinical importance.

So far as tests of liver function calculated to test the protein metabolism are concerned, little has been done which is clinically significant. One test which has been advocated consists of the administration of 50 Gm of gelatin and the subsequent quantitative examination of the urine for amino acids. In normal persons the excretion is prompt, and at least 200 mg of amino acid is present in the first four hour period, in the presence of disease of the liver there is considerable delay in excretion and the amount of amino acid in the earlier specimens of urine is small. We have had no experience with this method of study and would not expect it to yield information of great practical value when performed on man.

There is one phase of protein metabolism which is not strictly related to the matter which has just been considered but which is of considerable importance from a clinical standpoint. We refer to the variations in the plasma proteins which have been recognized as dependent on injury to the hepatic parenchyma. While there is no direct proof that the liver is the sole site of their manufacture, experimental studies furnish some indirect evidence of their possible hepatic origin. Kerr, Hurwitz and Whipple¹⁰ demonstrated that poisoning with phosphorus and carbon tetrachloride resulted in a moderate decrease in the value for the serum proteins and also that regeneration of serum protein, after plasmapheresis, occurred slowly in the presence of hepatic injury or of an Eck fistula. Recent work in Whipple's (Holman, Mahoney and Whipple¹¹) laboratory indicated that there is a reserve of protein-building material in the organism, which is stored, at least in part, in the liver and which probably consists of at least 50 per cent of albumin or albumin-producing material. These investigators recently expressed the opinion that there probably is a dynamic equilibrium between tissue and plasma protein, and the material stored in the liver may figure in this equilibrium.

There is a long series of reports on the relation of hepatic disease to the value for the serum protein, the

⁸ Watson C. J. Studies of Urobilinogen. I. An Improved Method for the Quantitative Estimation of Urobilinogen in Urine and Feces. *Am J Clin Path* 6: 458-475 (Sept.) 1936.

⁹ Bollman J. I., Mann F. C. and Magath T. B. Studies on the Physiology of the Liver. VIII. Effect of Total Removal of the Liver on the Formation of Urea. *Am J Physiol* 69: 371-392 (July) 1924. Studies on the Physiology of the Liver. IX. Uric Acid Following Total Removal of the Liver. *Am J Physiol* 72: 629-646 (May) 1925.

¹⁰ Kerr W. J., Hurwitz S. H. and Whipple G. H. Regeneration of Blood Serum Protein. II. Influence of Diet upon Curve of Protein Regeneration Following Plasma Depletion. *Am J Physiol* 47: 3-10 (Dec. 1) 1918. Regeneration of Blood Serum Proteins. III. Liver Injury Alone, Liver Injury and Plasma Depletion. The Eck Fistula Combined with Plasma Depletion. *ibid* 47: 379-392 (Dec. 1) 1918.

¹¹ Holman R. L., Mahoney E. B. and Whipple G. H. Blood Plasma Protein Given by Vein Utilized in Body Metabolism. II. A Dynamic Equilibrium Between Plasma and Tissue Protein. *J Exper Med* 59: 269-282 (March) 1919.

literature on the subject has been cited recently by Myers and Keefer¹². It has been observed repeatedly that in advanced chronic hepatic lesions there is a moderate reduction in the value for the serum proteins, the diminution occurs chiefly in the albumin fraction and there is a reversal of the albumin-globulin ratio. In the presence of less advanced lesions, the amount of albumin may be only moderately reduced and the amount of globulin may be normal or increased. In any type of hepatic disease, however, the effects on the albumin-globulin ratio are somewhat the same. In some cases of advanced cirrhosis observed at the clinic the albumin-globulin ratios were as low as 0.3, in less serious types of cirrhosis the changes in the ratio are not marked or constant, and the variations noted tend to return to normal as improvement takes place. In all but a few of a fairly large series of cases of all types of hepatic disease, the albumin-globulin ratio has been disturbed considerably but there was not much reduction in the value for the total proteins. The rapidity with which changes in the amount of total protein and in the albumin-globulin ratio may take place is rather striking, and repeated determinations in the same case indicate that these changes may not be without some prognostic significance.

Peters and Eisenman¹³ have properly raised the objection that such variations in serum proteins may be of nutritional origin and may not be attributable to failure of production of protein by the liver. However, the rapidity with which variations occur is not easily explained on a nutritional basis, and it also is known that in cases of hepatic disease feeding with protein has little effect on either the value for the serum protein or the albumin-globulin ratio. Similar observations have been made in cases of intermittent obstructive jaundice in which diets of known composition were used. Likewise, in cases of portal cirrhosis and ascites the amount of protein lost in ascitic or edema fluid does not seem to be important. In general, the clinical and experimental evidence related to decrease in the amount of serum proteins in cases of hepatic injury seems to indicate a failure of production of protein or protein-building substances on the part of the liver, and an altered equilibrium between circulating and stored protein.

The principal effects referable to the reduced albumin content of the blood serum of patients who have hepatic disease are obviously related to the production of ascites and edema. It is probable that ascites in hepatic disease does not depend necessarily on the value for the serum proteins alone but that such factors as portal venous stasis and chronic peritoneal irritation play an important part. The decrease in the amount of serum albumin is, however, a most important contributing factor, which may reduce the osmotic pressure enough to allow transudation under certain conditions (Snell and Maclay¹⁴).

Fat and Cholesterol Metabolism—It has been known for many years that in the presence of parenchymatous disease of the liver, or even following acute toxemias and infections, the amount of fat in the individual hepatic cells is greatly increased and the glycogen con-

tent is diminished at the same time. This, of course, does not necessarily imply that the liver is directly concerned in the regulation of fat metabolism, although some indirect connection of this sort cannot be excluded. It is also known that in obstructive jaundice, when bile is completely excluded from the intestinal tract, fats are absorbed poorly. The hemokonia test of Brule¹⁵ was based on this observation and by the use of this test it is possible to demonstrate a failure of any increase in the microscopic particles of blood fat which normally appear after a mixed meal. Unfortunately, the test reveals little more than can be learned by examination of the stools and duodenal contents and hence is not clinically important.

A study of the cholesterol and cholesterol esters in the plasma in various types of disease of the liver has been carried out in various institutions for many years, and many men prominent in the field of medicine have contributed information bearing on this subject. In a recent article Epstein and Greenspan¹⁶ summarized the entire matter very well and those interested are referred to this article for details. We have records of a rather large number of determinations of cholesterol and cholesterol esters in the plasma of patients who had various types of biliary obstruction and parenchymatous disease of the liver, the results in general confirm those which have been reported by these and other writers. In obstructive jaundice there is usually a sharp rise in the values for both the cholesterol and the cholesterol esters, which may be roughly parallel to the elevation of the value for the serum bilirubin. If biliary obstruction of long duration, cholangitis or obstructive biliary cirrhosis complicates the picture, the value for the cholesterol in the plasma may be normal or decreased. In cases in which acute parenchymatous disease of the liver is associated with jaundice, the value for the cholesterol may be decreased or normal and that for the cholesterol esters may be diminished or these esters actually may be absent. It has been thought that the value for the cholesterol esters gives some idea of the severity of the injury to the liver and of the prognosis, but in our experience this has not been entirely substantiated. In the ordinary types of portal cirrhosis the value for the cholesterol usually is normal except when acute degeneration of the liver supervenes. As Epstein and Greenspan¹⁶ have wisely remarked in evaluating a single determination of the amount of cholesterol in the plasma it is important to consider the clinical sequence of events and to make allowances for the stage of the disease and for the possible existence of infectious or extrahepatic disease which might influence the results.

Carbohydrate Metabolism—The most significant result of experimental hepatectomy perhaps is the decrease in the value for the blood sugar and the hypoglycemic reaction which continues because the normal store of glycogen in the liver is abolished. If the capacity of the liver to maintain the normal amount of blood sugar is one of the most important functions of this organ, it is perhaps to be expected that this function would be conserved to the very end in the presence of disease of the liver. This seems to be the case and for this reason functional tests of carbohydrate metabolism have been disappointing in practice. In advanced hepatic injury from whatever cause, hypoglycemia is

12 Myers W. K. and Keefer C. S. Relation of Plasma Proteins to Ascites and Edema in Cirrhosis of the Liver. Arch. Int. Med. 55: 349-359 (March) 1935.

13 Peters J. P. and Eisenman Anna J. The Serum Proteins and Diseases Not Primarily Affecting the Cardiovascular System or Kidneys. Am. J. Med. Sci. 196: 808-833 (Dec.) 1933.

14 Snell A. W. and Maclay, Elizabeth. The Effects of Chronic Disease of the Liver on the Composition and Physicochemical Properties of Blood. Changes in the Serum Proteins. Reduction in the Oxygen Saturation of the Arterial Blood. Ann. Int. Med. 9: 690-711 (Dec.) 1935.

15 Brule Marcel. Recherches sur les ictères les rétentions biliaires par insuffisance hépatique. ed. 3. Paris: Masson et Cie. 1927.

16 Epstein E. Z. and Greenspan E. B. Clinical Significance of Cholesterol Partition of the Blood Plasma in Hepatic and in Biliary Diseases. Arch. Int. Med. 58: 860-890 (Nov.) 1936.

but rarely seen, a hypersensitiveness to insulin has been noted, and one sees an occasional hypoglycemic reaction in cases in which diabetes and hepatic disease are coexistent. Likewise, it has been noted that when obstructive jaundice or cirrhosis is associated with severe diabetes, the glycosuria becomes easier to control and the administration of insulin is no longer necessary, as the hepatic lesion improves, a return to the earlier status is to be expected. Insulin, water and standard doses of dextrose have been given simultaneously and the values for the blood sugar have been studied at intervals thereafter (Althausen and Mancke¹⁷), by this method it is sometimes possible to show variations in the values for the blood sugar which indicate a low glycogen reserve and which tentatively point to the presence of hepatic injury. Our experience with this test is limited, but in general we may say that it has not as yet been generally employed or accepted, the principal objections obviously are based on possible variations in the nutritional state of the patient to be tested, and these variations may influence the result.

Two other sugars, levulose and galactose, have been widely used in the study of hepatic function, their employment is based on the fact that the normal liver can utilize them for storage (as glycogen) without producing significant glycosuria or hyperglycemia. The levulose tolerance test, as advanced by MacLean and de Wesselow,¹⁸ had its inception in Schirokauer's¹⁹ observation that the value for the blood sugar of normal persons was virtually unaffected by the oral administration of levulose, whereas it was increased in the presence of hepatic disease. In performing this test we have administered a standard dose of 40 Gm of levulose in 200 cc of lemonade, the value for the blood sugar was determined one and two hours later, an increase of more than 30 mg per hundred cubic centimeters in the value for the blood sugar is considered indicative of a positive test. Space prohibits a detailed consideration of the results. When the test was performed on experimental animals and all outside influences were excluded, the results were reasonably reliable, but when it was performed on patients, many difficulties and errors were encountered. A low initial value for the fasting blood sugar, mild diabetic tendencies, and chronic pancreatic disease all tend to vitiate the results. There is no doubt that rather consistent results may be obtained under ideal conditions, particularly if the value for levulose in the blood is determined, in general, however, the field of usefulness for this test is limited.

Galactose tolerance tests have had an even greater vogue in clinical medicine, especially in European clinics, the test is based on the observation that a normal person can assimilate a 40 Gm oral dose of galactose without the loss of more than from 2.5 to 3 Gm of sugar in the urine in the five hours immediately following the administration of the galactose. In the presence of hepatic injury, conversion of this sugar into glycogen fails sufficiently to allow for a degree of glycosuria above this arbitrary level. As advocated in Germany by Brauer²⁰ and in this country by Shy

and Schloss,²¹ the test has been used to distinguish intrahepatic jaundice from obstructive jaundice, a positive test is said to denote parenchymatous damage, a negative one supposedly indicates a substantially normal hepatic parenchyma. Actually, as Banks and his co-workers²² showed, there are two serious stumbling blocks: the test is consistently negative in portal and biliary cirrhosis and is positive in from 25 to 40 per cent of cases in which obstructive jaundice has persisted for a sufficiently long time to injure the hepatic parenchyma. In rather acute conditions associated with jaundice, a positive test is a strong argument for a primarily hepatic lesion, this is especially true in cases in which injury of the liver is produced by cinchophen derivatives, but even in this group of cases the results occasionally are negative. In cases of chronic jaundice the results show a large margin of error and therefore we may say that the test is not an infallibly reliable guide in differentiating obstructive jaundice from "intrahepatic" jaundice. So far as we have been able to determine, the test has no value whatever in cases in which the patients are not visibly jaundiced.

TESTS OF EXCRETORY FUNCTION

Although a large number of dyes have been used to test the excretory function of the liver, only two, rose bengal and bromsulfalein, have come into common use.

The rose bengal test is done without reference to the weight or age of the patient or to the amount of dye administered (Stowe, Delprat and Weeks²³). The standard is obtained from a sample of blood drawn two minutes after the dye is injected, a sample of blood drawn exactly eight minutes after injection is compared with the standard. Normally, 50 per cent or less of the injected dye (usually from 0.1 to 0.2 Gm) should be present in the blood eight minutes after the injection has been made. Retention of more than that amount is considered an indication of hepatic damage. Since the dye has a photosensitizing effect, the specimens should be kept in the dark and the patient should be protected from direct sunlight for some hours after the use of the dye. Analysis of results by others show that the test gives results comparable to those obtained by the bromsulfalein test. Certain difficulties, such as the obtaining of a satisfactory standard, adequate mixing of the dye in the blood stream, and the rigid time requirements of the test, are self evident.

The bromsulfalein test, which perhaps is the most generally satisfactory test for hepatic function yet devised, is simple in the extreme. As first proposed, a dose of 2 mg of the dye per kilogram of body weight was injected and specimens were obtained at five minutes, thirty minutes and one hour thereafter. O'Leary, Greene and Rowntree²⁴ first showed that the test could be improved by injection of 5 mg of the dye per kilogram of body weight, and Magath²⁵ further simplified the test by taking a single specimen at the end of one hour. More than 10,000 tests have been performed at the clinic by this method. The amount of dye present

17 Althausen T L and Mancke R. Kombinierte Leberfunktionsprüfung (Insulin, Glykose und Wasserbelastung). Arch f klin Med. 170: 294-301 (March 25) 1931.

18 MacLean H and de Wesselow O L V. The Estimation of Sugar Tolerance. Quart J Med 14: 103-119 (Jan) 1921.

19 Schirokauer Hans. Zur Funktionsprüfung der Leber. Die alimentäre Lävulose Hyperglykämie. Ztchr f klin Med 78: 462-475 1913.

20 Brauer Richard. Unsere Kenntnisse über Leberfunktion und ihre Verwertung für die Klinik. Wien klin Wchnchr 45: 1577-1581 (Dec. 23) 1932.

21 Shay Harry, and Schloss Eugene. Painless Jaundice. Its Differential Diagnosis by the Galactose Tolerance Test. J A M A 98: 1433-1436 (April 23) 1932.

22 Banks B M, Sprague P H and Snell A M. Clinical Evaluation of the Galactose Tolerance Test. J A M A 100: 1987-1993 (June 24) 1933.

23 Stowe W P, Delprat G D, and Weeks Alanson. The Rose Bengal Test of Liver Function. Am J Clin Path 3: 55-60 (Jan) 1933.

24 O'Leary P A, Greene C H and Rowntree J G. Diseases of the Liver. VIII. The Various Types of Syphilis of the Liver with Reference to Tests for Hepatic Function. Arch Int Med 14: 155-193 (Aug) 1929.

25 Magath T B. The Takata-Ara Test of Liver Function. Am J Digest Dis & Nutrition 2: 717-716 (Feb) 1936.

in the serum is determined by transverse comparison of the serum with standard tubes in a colorimeter. It was recently shown by Magath²⁸ that the results are extremely satisfactory, since a retention of dye occurred in 96 per cent of cases in which there was evidence of parenchymal hepatic injury or even moderate mechanical obstruction of the bile ducts which had not yet produced clinically demonstrable jaundice. It was observed that low-grade retention of the dye (less than 12 per cent but more than 4 per cent) was significant, indeed, it is most important, for in the presence of such retention clinical judgment is at a low threshold. Occasionally, retention of a low grade does occur without any evidence of hepatic disease, but this is rare. In one series of sixteen cases in which there was retention of the dye grade 1 (from 6 to 12 per cent) there were definite clinical evidences of hepatic injury in thirteen cases.

The test gives results which indicate the extent of parenchymatous damage only roughly but the determinations are sufficiently accurate to yield valuable information if the test is repeated at intervals during the course of the disease. Much confusion has arisen with regard to the interpretation of the results of the tests in cases of jaundice, particularly in those cases in which there is gross mechanical obstruction to the bile passages. While it is true that in most cases of visible jaundice there is complete retention of dye, it does not follow from this that obstruction to the major bile ducts is the only responsible factor. It is more than likely that even transient obstruction causes hepatic cellular injury, but under the circumstances the test cannot reliably indicate the fact. We have seen other cases of visible jaundice in which the test did not reveal significant retention, this is especially true in hemolytic jaundice of the familial type. In resolving jaundice the test frequently furnishes real information as to the progress of the disease, although determination of the values for the serum bilirubin may be superior in this respect. In general, we are not inclined to use the test in cases of clinical icterus, that is, in cases in which the value for the serum bilirubin is more than from 5 to 6 mg per hundred cubic centimeters, since the element of mechanical obstruction confuses the clinical picture when the values for the serum bilirubin are higher than this. In the absence of jaundice or if the value for the bilirubin does not exceed from 2 to 5 mg per hundred cubic centimeters, retention of the dye of moderate to maximal degree is important, slight, or grade 1, retention under these circumstances may be discounted to some extent.

In cases in which the patients are not jaundiced and the values for the serum bilirubin are normal, the degree of retention of the dye can be taken at its face value. Positive tests are the rule in chronic atrophy of the liver, cirrhosis, Banti's disease, hemochromatosis, chronic passive congestion, Pick-Concato disease, extensive fatty degeneration of the liver, amyloidosis, chronic hepatitis associated with familial hyperbilirubinemia, and in the recovery state of hepatogenous jaundice. In syphilitic cirrhosis, positive dye tests are the rule, but the degree of retention may be somewhat less than one would anticipate from the clinical evidence of hepatic injury. In these conditions, information of prognostic significance is afforded, high grades of retention of bromsulfalein are indicative of an unfavorable outcome, whereas surgical procedures, such as omentopexy and splenectomy, may be carried out with reasonable safety if dye retention, grade 1 or 2, is present.

The diagnostic value of dye tests in demonstrating a metastatic malignant condition must also be mentioned. Even a relatively moderate hepatic involvement will produce a significant degree of bromsulfalein retention. In many cases of abdominal and rectal malignant conditions observed at the clinic, invasion of the liver has been accurately detected on the basis of the results of this test.

In another group of cases in which toxic or infectious hepatic lesions are presumed to be present the bromsulfalein test will be positive. Among the toxic conditions must be mentioned *exophthalmic goiter*, a condition which is known to be associated with injury to the liver and poisoning of various types, latent hepatic injury due to cinchophen and other hepatotoxic substances also may be detected in this way. In various infectious diseases, notably undulant fever, retention of bromsulfalein may be noted during the height of the disease. Following an episode of acute cholecystitis or even biliary colic, retention of the dye may also be noted for brief periods. Finally, in the presence of biliary fistula, retention of the dye of high grade is a common finding, its significance is questionable, since in many instances the liver is anatomically normal at operation. Our experience with other dye tests is limited, presumably, the results would roughly parallel those obtained with bromsulfalein.

Among other tests of excretory function of the liver may be mentioned the bilirubin tolerance test. Because of the great value of the determination of the value for the bilirubin in the serum, von Bergmann²⁹ thought that a further test of the ability of the liver to excrete this substance would be useful. He accordingly devised the bilirubin function test. One milligram of bilirubin per kilogram of body weight is administered intravenously and one then determines whether or not this increases the amount of bilirubin in the serum. The amount of bilirubin present in the serum four hours after this injection is compared with the amount present five minutes after the injection. A retention of more than from 5 to 6 per cent was considered abnormal by Soffer.¹ The test, while theoretically sound, has certain obvious drawbacks, not the least of which is its cost. Soffer reported the results of the test in seventy-two cases of well defined hepatic disease. It was positive in 86.1 per cent of these cases. Since a positive reaction is dependent on an extremely small increase in the amount of bilirubin as compared to the control values, it is evident that the determination must be extremely accurate. Under some conditions the value for the serum bilirubin at the end of four hours may be only 0.05 mg per hundred cubic centimeters greater than the control value but may represent a retention of 7 per cent. There is of course reasonable doubt that such a small amount of bilirubin may be determined with accuracy. However, the test is said to be extremely sensitive and it no doubt will be improved and adapted to general use. Soffer¹ recently called attention to some important technical modifications and said that the greatest sphere of usefulness of the test is in cases in which the value for the bilirubin does not exceed 1 mg per hundred cubic centimeters.

MISCELLANEOUS TESTS

The Takata-Ara Test—This is a colloidal reaction performed on serum, it was first proposed as a method of differentiating bacterial meningitis and syphilis.

²⁸ von Bergmann G. Zur funktionellen Pathologie der Leber, insbesondere der Alkohol Aetologie der Cirrhose. Klin. Wochenschr. 6, 127 (April 23) 1927.

involvement of the central nervous system Jezler²⁷ later applied the test to the study of parenchymatous diseases of the liver. The literature stresses the importance of the test in identifying cirrhosis of the liver. It is true that in this disease, especially if it is advanced, the test will be positive, but in the earlier stages of the disease many negative tests are obtained. By and large, one may expect to obtain a positive Takata-Aia test in about half of all cases of parenchymatous disease of the liver and there will be a certain group of positive reactions when no evidence can be obtained on which to base the diagnosis of injury of the liver. One may conclude that a positive test does give confirmatory evidence in the diagnosis of cirrhosis, but the results are to be accepted with caution. In the absence of jaundice, this test is certainly not so sensitive as the bromsulphalein test.

The Appearance of Erythrocytes in Disease of the Liver—This may be mentioned, not as a test of liver function, but because studies on the morphology of the blood may give valuable confirmatory evidence of the presence of injury of the liver. A hypochromic macrocytic anemia is a rather uniform accompaniment of portal cirrhosis and may be noted in other types of injury of the liver. Similar changes have been demonstrated in the experimental animal by Higgins and Stasney²⁸. The rapidity with which such macrocytes appear in the blood stream has been explained on the basis of hypoproteinemia and swelling of the erythrocytes because of the altered osmotic pressure of the plasma.

COAGULATION FACTORS, MEASUREMENT OF THE TENDENCY TO BLEED

Many procedures have been designed to measure the coagulation time of the blood accurately, but none give a consistent picture of the dangers of bleeding in hepatic disease. The standard Lee-Vincent method is most generally used, and within the limitations of all such procedures the results are satisfactory. However, patients who have a prolonged coagulation time (in excess of seven minutes) may go through a surgical procedure without difficulty, while in other cases in which the blood appears to clot at a normal rate, fatal bleeding may occur. As Ivy has put it, the best test for bleeding tendencies in disease of the liver is to see whether the patient bleeds. Studies on fibrinogen, on calcium in its diffusible and nondiffusible forms, and on various other constituents of the blood have failed to solve the riddle of why the patient who has hepatic disease is so subject to hemorrhage. The results of recent studies which have been made on recalcified plasma and on whole blood by using physical methods of measurement have been encouraging, Nygaard and Baldes²⁹ have shown that the "plasma coagulation index," as measured by their method, gives a satisfactory basis for prediction of the tendency to bleed. They also have developed a photo-electric method of observing the coagulation of blood, this method is based on the principle of light extinction by the clot as it forms, which gives a remarkably good idea of the rate of clot formation. Repeated "coagelgrams" will often show the recession or development of the hemorrhagic ten-

dency. Quick and his co-workers³⁰ have demonstrated a deficiency of prothrombin in cases of jaundice, by a new method of studying the coagulation of blood. The methods which have been mentioned are not as yet in general use and may be too involved for practical purposes, their technical accuracy, however, and their close correlation with clinical observations render them worthy of further study. For clinical purposes, the following rule of thumb can be laid down with regard to bleeding in hepatic disease: (1) Any patient who has an injured liver parenchyma may bleed in spite of normal results of any existing test for coagulating factors, (2) the greater the degree of hepatic insufficiency, the greater the danger of hemorrhage, (3) high values for bilirubin in cases of icterus and high grades of retention of bromsulphalein in cases in which there is no icterus are danger signals and furnish information which is as reliable as that furnished by any current method of studying coagulation of blood.

THE ELIMINATION OF BILE SALTS

The salts of cholic acids, as they are found in bile, represent an exclusively hepatic product. As Smyth and Whipple³¹ demonstrated years ago, the rate of their production in a dog which had a biliary fistula seemed to reflect the functional state of the liver, after the administration of hepatotoxic substances the concentration and total output of bile acids fell to very low levels and rose as recovery took place. Naturally, many attempts have been made to study the production of bile acids in the human subject, as a test for liver function. Determination of the amount of bile acids in duodenal contents, while entirely possible, is of little value since the material studied is a mixture of bile and secretions from the digestive tract. No known method of determining the amount of bile acids in the blood is satisfactory, this closes a promising method of approach. The determination of the amount of bile acids in the urine is subject to too many variable factors to make it a matter of clinical importance in cases of jaundice. Following operation, when bile can be obtained from drainage tubes or from fistulas, the study of bile acids by using the Gregory-Pascoe method of determination may give useful information, as numerous investigations have shown that low concentrations consistently are of grave prognostic significance. While there is usually a period after operation when the concentration and total output of bile acids are decreased, ordinarily normal values are attained within a few days, when and if the liver regains its normal capacity to manufacture these substances. Further simplification of the method will undoubtedly make it available for more general use, even now it is clear that much may be learned from the study of bile obtained from fistulas either before or after operation.

QUANTITATIVE ESTIMATION OF PHOSPHATASE

Phosphatase, which is an enzyme concerned in the metabolism of bone, is present in many tissues of the body and is found in high concentrations in bone, kidney, intestinal mucosa and liver. Roberts³² first noted that high values for phosphatase in the serum were a feature of some cases of obstructive jaundice, while,

²⁷ Jezler, Adolf. Die Takatasche Kolloidreaktion in Serum und Korperflüssigkeiten und ihre Beziehungen zu Störungen des Eiweissstoffwechsels der Leber. *Ztschr. f. klin. Med.* 114: 739-756, 1920.
²⁸ Higgins, G. M. and Stasney, Joseph. Macrocytic Anemia in Experimental Cirrhosis. *Proc. Staff Meet. Mayo Clin.* 10: 429-432 (July 3) 1935.
²⁹ Nygaard, K. K. and Baldes, E. J. Interpretation and Clinical Significance of Coagelgrams in Obstructive Jaundice. *Proc. Staff Meet. Mayo Clin.* 11: 705-709 (Nov. 4) 1936.

³⁰ Quick, A. J., Stanley, Prown, Margaret and Bancroft, F. W. A Study of the Coagulation Defect in Hemophilia and in Jaundice. *Am. J. M. Sc.* 100: 01-511 (Oct.) 1935.
³¹ Smyth, J. S. and Whipple, G. H. Bile Salt Metabolism. I. Influence of Chloroform and Lithoporus on Bile Fistula Dogs. *J. Biol. Chem.* 59: 623-636 (April) 1924.
³² Roberts, W. M. Variations in the Phosphatase Activity of the Blood in Disease. *Brit. J. Exper. Path.* 11: 90-95 (April) 1930.

in the nonobstructive types, low or normal values were the rule. A considerable number of papers lately have appeared on this subject, most of which have been cited in a recent article by Rothman and his collaborators³³. The technic generally used in the determination is that of Roberts, this involves a determination of inorganic phosphate liberated when the enzyme present in the blood is allowed to act on a phosphoric acid ester substrate under standard conditions. The upper normal value for adults is approximately 6 units and that for children is 15 units. Rothman and his collaborators³³ recently stated that in most cases of proved obstructive jaundice the value for the phosphatase was more than 10 units but that values of 20 or more units were commonly observed, in cases of nonobstructive jaundice values of less than 10 units were the rule. Our own experience with the method has not been large but in general the results have been in agreement with Rothman's. Greene and his collaborators,³⁴ on the other hand, expressed the opinion that the information obtained by determinations of phosphatase is inaccurate and does not differentiate the type of jaundice in question. Further experience will be required to establish the proper place of this test, but it is apparent that the results of the determination of phosphatase will have to be weighed against the clinical evidence in cases in which the diagnosis is doubtful.

TESTS OF THE DETOXIFYING FUNCTION OF THE LIVER (SYNTHESIS OF HIPPURIC ACID)

The ability of the liver to remove from the circulation various noxious substances, alter them chemically, or combine them with certain common constituents of blood in such a manner as to render them physiologically inert has been known to physiologists for years. The conversion of indole to indoxyl sulfuric acid, the conjugation of cholic acid to form bile salts, and the formation of conjugated glucuronates are familiar examples of this process. Various clinical tests with such substances as thymol, menthol, camphor, salicylates, phenol and *p*-cresol, and guaiacol sulfuric acid have been used but have not been entirely successful. The only survivor of such tests of the detoxifying function is one that is based on the ability of the liver to conjugate benzoic acid and aminoacetic acid to form hippuric acid. Early studies by Bryan³⁵ and more recent application of the test by Quick³⁶ have shown that the results are consistent in hepatic disease. While the early studies of Bunge and Schmiedeberg³⁷ showed that in the dog the synthesis of hippuric acid is affected by the kidney, this is probably not the case in the human being and, as Quick³⁶ has pointed out, the results seem to depend largely on the rate at which the liver can supply aminoacetic acid. It has been reasonably well established that, if the value for the blood urea is normal, the rate of synthesis of hippuric acid in clinical patients can be correlated with the degree of hepatic injury.

The test is performed by administering 6 Gm of benzoic acid to the fasting patient and collecting the

urine for four hours thereafter. A simple gravimetric method of analysis is used in determining the amount of hippuric acid, a correction is made for the hippuric acid still dissolved in the urine and the result converted to terms of benzoic acid by multiplying by the factor 0.68. For normal persons the excretion of hippuric acid (calculated as benzoic acid) ranges from 2.6 to 3.3 Gm, to exclude a possible factor of delayed elimination by the kidney, Kohlstaedt and Helmer³⁸ suggested making a simultaneous study of urea clearance. If this can be done, reduction of synthesis of benzoic acid to less than 2 Gm may probably be regarded as significant. In a large number of the tests performed at the clinic in the past two years, it has been noted that for patients who are not jaundiced the results closely paralleled the more familiar bromsulfalein test, while in cases of hepatogenous or obstructive jaundice the reduction in the synthesis of hippuric acid corresponded in a general way to the degree of hepatic injury noted at operation or necropsy. In "surgical" types of icterus it was found that values of less than 1.5 Gm were associated with an unfavorable prognosis and that few patients survived if this or a greater degree of hepatic insufficiency was indicated by the test. The simplicity of the test, its adaptability to the jaundiced patient, and its apparent reliability recommend it for general use, particularly in evaluating prognosis and surgical risk. Some care must be taken to eliminate the factor of renal injury, which may influence the result, dehydration and malnutrition like wise seem to depress the possible rate of synthesis. Gastric retention must obviously be considered as a possible explanation in cases in which low values cannot be otherwise explained.

SUMMARY AND CONCLUSIONS

In the foregoing paragraphs we have reviewed the theoretical basis, methods, limitations and interpretations of a series of tests for liver function in use at the Mayo Clinic. It has been emphasized that many of the procedures are not functional tests at all but merely laboratory procedures which throw some light on one or another aspect of disease of the liver. We have attempted to outline the particular field of usefulness for each of the tests and to point out that none of them are infallible or universally applicable. For practical purposes it may be said: (1) In types of disease of the liver not associated with jaundice, information gained from the study of retention of bromsulfalein is as reliable as that which can be gained in any other way, and that under these conditions other tests give chiefly confirmatory evidence, (2) in cases of jaundice, some information, which is not altogether reliable, as to the possible hepatogenous or obstructive nature of the jaundice in any given case can be had by studies on excretion of galactose, the value for cholesterol and cholesterol esters in the plasma, and the value for serum phosphatase, and (3) the best information as to the state of functional activity of the liver in cases of jaundice can be gained from a consideration of the value for the serum bilirubin, its daily variations and a knowledge of the anatomic changes which these may represent. So far as indirect methods of measuring liver function in the presence of icterus are concerned the hippuric acid test gives reasonably accurate results which should not, however, supplant the impression gained from purely clinical study.

33 Rothman M. M., Meranze D. R. and Meranze Theodore. Blood Phosphatase as an Aid in the Differential Diagnosis of Jaundice. *Am. J. M. Sc.* 192 526-535 (Oct.) 1936.

34 Greene C. H., Shattuck H. F. and Kaplowitz Lillian. The Phosphatase Content of the Blood Serum in Jaundice. *J. Clin. Investigation* 13 1079-1087 (Nov.) 1934.

35 Bryan A. W. Clinical and Experimental Studies on Sodium Benzoate. The Value of the Sodium Benzoate Test of Renal Function and the Effect of Injury of the Liver on Hippuric Acid Synthesis. *J. Clin. Investigation* 2 133 (Oct.) 1923.

36 Quick A. J. The Synthesis of Hippuric Acid. A New Test of Liver Function. *Am. J. M. Sc.* 135 630-635 (May) 1933.

37 Bunge G. and Schmiedeberg O. Arbeiten aus dem Laboratorium für experimentelle Pharmakologie zu Strassburg. 15. Ueber die Bildung der Hippursäure. *Arch. f. exper. Path. u. Pharmacol.* 6 233-255 1877.

38 Kohlstaedt K. G. and Helmer O. M. A Study of the Hippuric Acid Excretion as a Test of Hepatic Function. *Am. J. Digest. Dis. & Nutrition* 3 459-466 (Sept.) 1936.

ROCKY MOUNTAIN SPOTTED FEVER
IN THE EAST

REPORT OF A CASE

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Statistics from the public health department¹ given in the accompanying table show that prior to the positive identification of Rocky Mountain spotted fever in the East by Badger, Dyer and Rumreich² in 1931 only three cases had been reported east of the Mississippi River, one in Indiana (1925), one in New York (1925) and one in Norfolk, Va. (1926). The frequency of recognition of the disease in the Eastern states has steadily increased, however, in the last decade. We know of eight cases in the region of Philadelphia in the last two years, and an outbreak occurred in southern New Jersey in the spring of 1937. This continued recurrence of the disease in our vicinity as well as reports from other eastern localities, has impressed us with the fact that the disease is established permanently in the East. Some authorities³ have stated that the disease has been present in the East for a very long time but that it has only recently been recognized. This fact and the report of a case of Rocky Mountain spotted fever contracted in southern New Jersey and admitted to the Pennsylvania Hospital in June 1936 is therefore a timely reminder to be on the lookout for the disease.

Spotted fever is conveyed to man from infected animals by the tick.⁴ The chief vector of the Western, or Bitter Root Valley, type is the wood tick (*Dermacentor andersoni*), whereas in the East it is the dog tick (*Dermacentor variabilis*). Many animals, both domestic and wild, particularly of the rodent family, act as hosts for the transmission of the disease from tick to tick. Moreover, eggs, larvae and nymphs⁵ which have never fed on any infected host have been shown to contain Rickettsial bodies, proving that the disease in ticks may be hereditary. The rabbit tick transmits the disease from rabbit to rabbit⁶ but has never been known to transmit the disease directly to man. However, if the infected rabbit becomes host to a dog tick, the dog tick may transmit a more severe form of the disease to man. Passage of the virus through the wood tick or dog tick seems to enhance its virulence.² Certain birds, notably the meadow lark, and mice have been shown recently to be possible carriers.⁶

In man the incubation period of the disease is from two to twelve days, with prodromal backache, malaise and anorexia. The onset is characterized by chills, fever and headache, and on about the second to the

fourth day a petechial rash appears on the wrists, forearms and ankles, gradually spreading to the back, arms, legs and chest. The palms of the hands and the soles of the feet are commonly involved, the face rarely. The rash, at first petechial, becomes macular and more confluent as the disease progresses. The fever reaches its height during the second week and falls, usually by lysis, after from twelve to twenty-two days. Stupor and delirium may be prominent features.

Pathologically, the disease primarily affects the blood vessels. Panangitis with thrombocytopenia is the specific lesion, as contrasted to the proliferative panangitis of typhus. Enlargement of the spleen, bronchopneumonia and meningeal congestion are prominent in the Eastern, whereas scrotal gangrene and serous ecchymosis are more prevalent in the Western, type.

The mortality in the East has been estimated to be about 25 per cent,⁸ whereas in the Bitter Root Valley

Number of Cases of Rocky Mountain Spotted Fever Reported
in the United States for the Years 1925-1935, Inclusive
(U. S. Public Health Service)*

State	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
Middle Atlantic											
New York											
New Jersey											
Pennsylvania											
East North Central											
Indiana											
Illinois											
West North Central											
Minnesota											
Iowa											
North Dakota											
South Dakota											
Nebraska											
Kansas											
South Atlantic											
Delaware											
Maryland											
District of Columbia											
Virginia											
West Virginia											
North Carolina											
South Carolina											
Georgia											
Florida											
East South Central											
Kentucky											
Tennessee											
Alabama											
West South Central											
Louisiana											
Oklahoma											
Mountain											
Montana											
Idaho											
Wyoming											
Colorado											
New Mexico											
Arizona											
Utah											
Nevada											
Pacific											
Washington											
Oregon											
California											

* Spaces in which numbers do not appear indicate that no cases of Rocky Mountain spotted fever were reported. States omitted did not report any cases of Rocky Mountain spotted fever.

(Montana) it has reached from 80 to 90 per cent. The disease seems to be less severe in younger persons.

The clinical features readily differentiate the disease from most other exanthems. Meningitis may at first be suspected but normal spinal fluid readings readily exclude it. The positive Weil-Felix test, i.e., agglutination of *Bacillus proteus* X19 or X2 which is obtained usually within a week of the onset of the disease definitely places it among the Rickettsial

1 Personal communication to the authors from U. S. Public Health Department, Washington, D. C.

2 Rumreich, A., Badger, L. F. and Dyer, R. E. The Typhus Rocky Mountain Spotted Fever Group. An Epidemiological and Clinical Study in the Eastern and Southeastern States. Pub. Health Rep. 16: 470-480 (Feb.) 1931.

3 Reimann, H. A. Philadelphia. Personal communication to the authors.

4 King, W. W. Experimental Transmission of Rocky Mountain Spotted Fever by Means of the Tick. Preliminary Note. Pub. Health Rep. 20: 863, 1906.

5 Ricketts, H. T. Some Aspects of Rocky Mountain Spotted Fever as Shown by Recent Investigation. M. Rec. 76: 843-855, 1909.

6 Parker, R. R., Philip, C. B. and Jellison, W. L. Rocky Mountain Spotted Fever. Potentialities of Tick Transmission in Relation to Geographic Occurrence in the U. S. Am. J. Trop. Med. 13: 341 (July) 1933.

7 Lillie, R. D. Pathology of Eastern Type of Rocky Mountain Spotted Fever. Pub. Health Rep. 16: 28-30 (Nov. 27) 1931.

8 Dyer, R. E. Rocky Mountain Spotted Fever. Delaware State M. J. 6: 52-55 (March) 1934.

diseases.⁹ Pinkerton¹⁰ of Harvard has laid down in detail the criteria which enables the differentiation of Rocky Mountain spotted fever from the other members of this group.

Numerous widespread diseases fall into the Rickettsial group, four of which are immunologically distinct.¹¹ Typhus, tsutsugamushi spotted fever and trench fever. Of the eleven classified by Dyer,¹¹ typhus, spotted fever and tsutsugamushi predominate. The other members of the group are (1) South African tick fever, (2) pseudotyphus of Sumatra (3) tick typhus of India (4) a typhus-like disease in Australia, (5) tropical typhus of the Malay states, (6) rural typhus-like disease in Kenya East Africa (7) fièvre boutonneuse of the Mediterranean Littoral and (8) exanthematic typhus of São Paulo, Brazil.¹² Dyer did not include trench fever in this classification. Fièvre boutonneuse and exanthematic typhus of São Paulo have been shown by Davis and Parker¹³ to be immunologically the same as spotted fever. Perhaps others of this group will ultimately be classifiable immunologically as either typhus, tsutsugamushi or spotted fever.

Typhus, so far as is known, is the oldest of the recognized Rickettsial diseases. It is a lice and flea borne disease. It is therefore chiefly urban in distribution and is more common in the fall and winter months. The rash of typhus occurs first on the body and, unless the attack is severe, does not spread to the face and extremities.

Tsutsugamushi, also of this group, has not been reported in this country. It has quite distinct clinical features, it is endemic in Indo-China and is disseminated by mites.

Trench fever, particularly prevalent during the World War, is disseminated by the body louse and runs a short course (from one to five days).

Spotted fever is next to typhus in importance. The history of tick contact is often obtained. The disease is rural and occurs in the tick season, i. e., during the spring and summer months. The rash begins on the extremities and extends to the body. The final differentiation between typhus and spotted fever rests on cross immunity or neutralization tests in animals.¹⁴ The latter is done by mixing convalescent serum with the known virus and inoculating a guinea pig with the mixture. If no disease results, the virus used indicates the strain. The cross immunity test consists of the inoculation of animals recovered from known strains with blood from the patient. If no disease results in the animal, the disease in question is the same as that from which the animal recovered.

The prevention of spotted fever consists chiefly in measures directed against ticks. In regions in which ticks are prevalent a careful search for ticks on the body at least twice a day is an important precaution. The virus is not transmitted for several hours after the tick begins to feed,¹⁵ probably because the dormant virus in the tick becomes activated by fresh blood. The wearing of suitable clothing with the upper gar-

ment stuffed into the lower, because the ticks always crawl upward before becoming attached, is helpful. The immersion of domestic animals in arsenic trioxide solution (sodium carbonate 24 pounds, arsenic trioxide 8 pounds, pine tar from 1 to 2 gallons, water 40 gallons), and the presence of chickens, which eat ticks and are immune to the disease, are also helpful measures. The establishment of tick parasites in tick infested areas is also worth while.

A vaccine prepared by grinding up infected ticks in a phenolized emulsion and using the supernatant fluid is a useful prophylactic agent and should be used in regions where the disease is prevalent. This vaccine is given in two subcutaneous injections of 2 cc each for adults and 1 cc each for children under 10 years of age.

REPORT OF CASE

M. P., a youth, aged 16, admitted to the Pennsylvania Hospital July 2, 1936, complained of headache, nausea, vomiting and "chilly sensations" dating from June 26. A skin rash and photophobia were among the complaints. Past illness and the family history were not important.

The boy had left Philadelphia June 14 to pick berries at Blue Anchor, N. J., where he drank water from a spring and went swimming in a fresh water lake. He gave a history of picking ticks from a dog and crushing them with his fingers but did not recall being bitten.

June 26 he suffered from headache and nausea, he became feverish June 28, anorexia and general weakness followed. June 29 he had epistaxis followed by expectoration of blood-stained sputum and he vomited all nourishment that he took. He was given an enema twice because of constipation.

Because of continued fever with delirium and the appearance of a rash the patient was brought to his home in Philadelphia. According to the patient's brother the rash appeared first on his chest, spreading to his arms, but after recovery the patient recalled that the rash began on his extremities and involved the body later.

On admission July 2 he was seriously ill, with a temperature of 104 F., pulse 100, respiration rate 32. He was very weak, apathetic, sluggish and confused. A foul and sweetish odor on the breath was noted. He was slightly, and later markedly, hyperesthetic, resenting examination or handling. There was a maculopapular rash distributed profusely over the trunk, buttocks, median aspect of the arms, palms of the hands, dorsum and soles of the feet. The pinkish papules were slightly raised and varied in size from minute specks to 2 or 3 mm. in diameter. Some faded on pressure but most of them did not. These spots later, July 4, became a dull purple, giving a splotchy appearance.

The other positive manifestations were blood pressure 160 systolic, 70 diastolic, bloody crusts about the nose, conjunctiva injected, pupils dilated, lips dry, tongue slightly coated and pharynx mildly injected. Flexion of the neck caused pain. Reflexes were normal but the patient winced when tapped lightly with a percussion hammer.

July 3 he was seen by one of us (G. G. D.) and the following additional notes were made. The cheeks were heavily tarred and flushed, the tongue was coated, there was some reddening of the uvula and pharynx, the submaxillary glands were enlarged and tender on the left side, there was no rash on the face. The rash over the body and arms was papulomacular, the isolated eruption being pinpoint to pinhead in size, red, palpable, and most of them blanched on pressure, there was tenderness in the left axilla on pressure, roughening of the first sound at the cardiac apex, distant aortic first with accentuated aortic second sound, the abdomen was slightly distended with slight tenderness in the upper part, spleen was not palpable, tenderness about the knees, tibiae and muscles in general was noted.

July 4 the temperature was still between 103 and 104 F. The rash did not fade on pressure and had become dull purple.

July 5 the patient was very stuporous, mumbled to himself, was irrational, cried out in sleep and had incontinence of urine.

July 7 there was severe epistaxis and his complaint of headache.

9 Davis G. E. Weil Felix Reaction in Experimental Rocky Mountain Spotted Fever and Certain Other Typhus Like Diseases. Pub. Health Rep. 50, 404 (March 22) 1935.

10 Pinkerton H. Criteria for Accurate Classification of Rickettsial Diseases and Etiologic Agents. Parasitology 28, 172-189 (March) 1936.

11 Dyer R. E. Typhus and Rocky Mountain Spotted Fever in U. S. Harvey Lectures (1933-1934) 29, 41-66, 1935.

12 Lemos Monteiro J. L. Vaccine Against Exanthematic Typhus of São Paulo. New Correlations Between this Infection and Rocky Mountain Spotted Fever. Brazil med. 49, 116-121 (Feb. 2) 1935.

13 Davis G. E. and Parker R. R. Immunity. Additional Studies in Relationship of Virus of Rocky Mountain Spotted Fever and São Paulo Exanthematic Typhus. Pub. Health Rep. 18, 1006-1011 (Aug. 18) 1933.

14 Lillie Davis G. Rocky Mountain Spotted Fever Invades the East South. N. Y. 27, 783-788 (Sept.) 1934.

15 Cumming J. G. Rocky Mountain Spotted Fever Invades the East South. N. Y. 27, 783-788 (Sept.) 1934.

July 8 the temperature dropped from 102.3 to 97 F at 3 p m, the patient was clearer mentally

July 9 the temperature was elevated, to 102 F The mental reaction was clearer

July 10 there was severe epistaxis, stupor was less marked

July 20 the rash was about gone except for slight pigmentation Constipation was troublesome, the temperature and pulse had been normal since July 16

July 22 the skin was desquamating in branny flakes with small scales on the hands and feet but none on the face

July 25 the patient was allowed up The convalescence was uneventful

During the acute phase the body temperature oscillated between 102 and 104 F It dropped to normal for two readings on July 8 but on July 9 and 10 it resumed its former level A fall by lysis followed

Additional Data—Blood there was a leukocytosis of from 16,000 to 22,000 with a mild secondary anemia July 13 the agglutination test with *Proteus* X 19 was positive in 1:160 concentration and on July 24 it had risen to 1:1,280

The blood Wassermann reaction was negative The blood culture, spinal fluid, stool and urine were normal

The diagnosis of spotted fever was confirmed by a positive neutralization test done through the courtesy of Dr R E Dyer of the Public Health Service of Washington, D C

The treatment was identical with that of typhoid, consisting of isolation, rest in bed, tepid sponging, acetylsalicylic acid for headaches and phenobarbital for insomnia, liquid diet, high in calories and given at frequent intervals

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FILTRABLE VIRUSES IN INFECTION OF THE UPPER RESPIRATORY TRACT

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In the past ten years a considerable amount of knowledge has accumulated relating to the etiology and the mechanism of infection of the upper respiratory tract Beginning with the common cold, it has been shown that there exists in this disease a filtrable virus¹ which can readily be demonstrated in the secretions of the upper respiratory tract The evidence for the existence of this virus rests on numerous transmission experiments in which typical acute colds have been produced under conditions of strict quarantine, both in anthropoid apes and in human volunteers, by intranasal inoculation of material derived originally from a human being with an early cold and freed from associated bacteria by filtration The regularity with which this filtrable virus can be recovered from patients with colds and the failure to demonstrate it in the secretions of normal persons have led to the belief that its role is one of etiologic importance The precise extent of this importance, however, is as yet hard to define Studies² of isolated communities suggest powerfully, although they do not conclusively prove, that without

the virus the whole complex of infection of the upper respiratory tract ceases to exist, i e that the bacteria of the upper respiratory tract are of themselves powerless to initiate infection If this is true then the virus can be regarded as the primary etiologic agent of infection in the upper respiratory tract Once the infection is started, pathogenic bacteria undoubtedly can play a role in influencing its severity and producing complications There exists some evidence on the mechanism of this interaction between virus and bacteria—evidence that, in addition to “activating” the bacteria,³ the virus may assist in their dissemination⁴ and even increase their essential virulence⁵

Considerations such as these have emphasized the importance of the virus component in infection of the upper respiratory tract, and it seemed to us desirable to make an extensive study of the general biologic properties of the cold virus Our first experiments of this nature dealt with its survival It was found that relatively short exposure to a temperature of 56 C completely inactivated the virus We next showed that it could be preserved at ice box temperature if anaerobic conditions were maintained, i e, that the original filtered nasal washing would retain full activity for at least a fortnight if stored in the cold under a petrolatum seal with cysteine hydrochloride Later on we demonstrated that if the original filtrate was frozen rapidly and desiccated in a high vacuum it would remain fully active for at least four months It was also found that the cold virus could be passed from one person to another, although the virus retained its activity we were unable to demonstrate any enhancement of virulence by such a procedure

Our next efforts were directed at cultivating the virus in an artificial medium For this purpose we employed a modification of the technique of Li and Rivers, in which a small amount of minced living chick embryo tissue was incorporated in a fluid menstruum, as we had already shown that the virus survived under anaerobic conditions, this medium was modified to secure anaerobiosis, and by this means the multiplication of the cold virus *in vitro* was demonstrated in seven of eight attempts at the initiation of a culture Prolonged experience in cultivating the cold virus has indicated that strains transferred at intervals of two or three days maintain their virulence better than strains transferred after longer incubation By this method fully active virus has been demonstrated in the eighty-eighth transfer of a culture seven months after the original isolation of the virus from its human source We invariably found, however, that a falling off in virulence occurs if strains of virus are cultivated for much longer periods than this Attempts at cultivating the cold virus under aerobic conditions have been unsuccessful

When the tissue culture medium containing virus is removed from the incubator and kept on ice, it has been found that a rapid inactivation of the virus takes place, presumably due to the injurious effect on the virus of products of the disintegrating tissue The same inactivation occurs even if the material is frozen and dried immediately after incubation However if a small quantity of acaric⁶ is added on removal from the incubator before freezing and drying, then the virus will remain fully active for a considerable period A

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Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N J, June 9, 1937

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method therefore is available for the production and preservation of cold virus in unlimited amounts

In addition to the use of the tissue medium described, we have recently employed the chorioallantoic membrane of the developing chick embryo as another means of cultivating cold virus. This technic has been used in connection with a number of filtrable viruses.⁷ In our experiment⁸ the chorioallantoic membranes of developing embryos were inoculated with a small amount of filtered nasal washings immediately after their isolation from a patient with an acute cold. Incubation was allowed to continue for two or three days, and then the ground up membranes were used for passage to the next series of eggs. Membranes from the third series of eggs were used for testing on two human volunteers, in both of whom typical acute colds developed. It appears therefore that cold virus can be cultivated in the developing chick embryo directly after isolation from its human source.

In summary, then, it has been demonstrated by a large series of transmission experiments on human beings that there exists in the common cold a filtrable virus which in all probability is the primary etiologic agent and can interact with the various pathogenic agents of the upper respiratory tract to produce more severe infections. The evidence, however, from numerous bacteriologic observations during transmission experiments is to the effect that the uncomplicated cold in adults is practically a pure virus disease. Certain of the biologic properties of this virus have been investigated, and a method has been developed for its artificial cultivation and preservation.

It was logical to apply the technic used in investigating colds to the problem of influenza. Influenza is a disease in the study of which one is faced at the outset with a difficulty of definition. In the first place, there is an obvious clinical difference between the severe manifestations of the 1918 pandemic and the milder manifestations seen in the small outbreaks of recent years. In the second place, it is difficult to make a satisfactory clinical diagnosis in an isolated case, with a resulting tendency for the physician to make a diagnosis of influenza in cases of sinusitis, streptococcal infection of the throat, gastroenteritis and, in fact, any febrile disorder in which the cause is uncertain. The great volume of research during and immediately after 1918 concerned itself chiefly with the bacillus of Pfeiffer (*Haemophilus influenzae*), as well as with one or two other organisms, and an enormous mass of contradictory evidence and opinion was recorded. Experiments at that time designed to test for the presence of a filtrable virus of influenza were few in number, limited in scope and also contradictory in outcome.⁹ More recently, in 1931, Long and his co-workers¹⁰ reported transmission experiments on chimpanzees suggesting the presence of a filtrable virus in influenza. However, the next year Costa Mandry and his associates¹¹ failed in an attempt to transmit influenza to human beings by means of filtered throat washings.

Our own studies of influenza were made with material derived from patients who had the disease in 1931, 1932, 1933, 1934 and 1935 in the winter month, when mild influenza of the interepidemic variety was prevalent. Our criteria for the diagnosis of influenza were as follows. The patient must show a sudden onset with a history of previous freedom from infection, constitutional symptoms must dominate the symptoms of local irritation of the upper respiratory tract, fever must be present and leukocytosis absent. Making use of these criteria, we obtained material from one patient in each of the five years mentioned. In the first year transmission to human volunteers was done with a filtered nasal washing directly after its being obtained from the patient, in the subsequent years the material was cultivated in anaerobic tissue medium and tested after many transfers *in vitro*.

Our experiences with influenza, which have been described elsewhere in detail,¹² may be summarized as follows: a total of thirty-nine tests on human volunteers has been made under conditions of strict quarantine with the five materials mentioned, with four of these a virus was demonstrated which, although productive of some constitutional reaction, could not be distinguished with certainty from the virus of the common cold. The fifth virus, obtained originally in a small but clinically severe outbreak, did produce in one of several volunteers an acute febrile disorder resembling influenza. The most that it was possible to conclude from this limited number of experiments was that a filtrable virus had been recovered from patients with interepidemic influenza.

The problem of influenza, however, was approached in 1933 by another technic. In England, Smith, Andrewes and Laidlaw¹³ reported the isolation of a filtrable virus from a patient with influenza which produced a febrile catarrhal disorder when introduced into the nasal passages of ferrets. This observation was soon confirmed by Francis,¹⁴ in this country. Since that time a great deal of important research has been carried out with human influenza virus both in England and in this country by the investigators mentioned.¹⁵ The results of this research may be summarized as follows. Several strains of the virus which is pathogenic for ferrets have been obtained, and they have been obtained exclusively from patients with typical attacks occurring in fairly severe outbreaks of the disease. Once established in ferrets the disease can be transmitted to white mice, in which after a few passages it produces a fatal pneumonia. Protective substances against this virus are found in the serum of ferrets recovered from the disease and also in the serum of human convalescents, as well as in many normal human serums. The production of antiviral substances in the serum can also be artificially effected by injecting virus into such unsusceptible animals as the rabbit and the horse. Immunologic studies performed with these various serums indicate that strains of influenza virus from different parts of the world are similar. Lastly, the virus can be cultivated in fluid medium con-

7 Woodruff A M and Goodpasture E W. *Am J Path* 7 209 (May) 1931.
8 Kneeland Yale Jr. Mills Katherine C and Dochez A R. *Proc Soc Exper Biol & Med* 25 213 (Nov) 1936.
9 Selter H. *Ann Inst Pasteur* 33 395 1919. Leschke E. *Berl klin Wchnchr* 56 11 1919. Yamamoto T. Sakakami K and Iwashima S. *Lancet* 1 971 (June 7) 1919. Kruze W. *Munchen med Wchnchr* 65 1228 1918. Friedberger E and Konitzer P. *Med Klin* 15 108 1919. Rosenau M J. *Experiments to Determine Mode of Spread of Influenza* J A M A 73 311 (Aug 2) 1919.
10 Long P H. Bliss Eleanor A and Carpenter Harriet M. *Etiology of Influenza* J A M A 97 1122 (Oct 17) 1931.
11 Costa Mandry O. Morales Otero P and Suarez Jenaro. *Puerto Rico J Pub Health & Trop Med* 5 203 (Dec) 1932.

12 Dochez A R. Mills Katherine C and Kneeland Yale Jr J. *Exper Med* 63 581 (April) 1936.
13 Smith Wilson Andrewes C H and Laidlaw P P. *Lancet* 2 66 (July 8) 1933.
14 Francis Thomas Jr. *Science* 80 457 (Nov 16) 1934.
15 Andrewes C H. Laidlaw P P and Smith Wilson. *Lancet* 2 859 (Oct 20) 1934. Francis Thomas Jr. *Proc Soc Exper Biol & Med* 32 1172 (April) 1935. Laidlaw P P. Smith Wilson. Andrewes C H and Dunkin G W. *Brit J Exper Path* 16 1 (June) 1935. Smith Wilson. Andrewes C H and Laidlaw P P. *ibid* 16 291 (June) 1935. Francis Thomas Jr and Magill T P. *J Exper Med* 62 503 (Oct) 1935. *Science* 82 353 (Oct 11) 1935. Smith Wilson. *Brit J Exper Path* 16 508 (Dec) 1935. Andrewes C H. Laidlaw P P and Smith Wilson. *ibid* 16 566 (Jan) 1935.

taining minced chick embryo tissue under aerobic conditions, and it has also been shown to propagate in the chorioallantoic membrane of the developing chick embryo

On the other hand, attempts to initiate a transmissible virus disease in ferrets with material derived from persons with common colds or, for that matter, from persons with any condition except typical influenza in fairly severe outbreaks have been failures. An evaluation of all these results can therefore be made as follows. The primary etiologic agents of certain acute infections of the upper respiratory tract seem to be filtrable viruses, the fact that virus from patients with severe influenza is pathogenic for ferrets and can be cultivated best in aerobic medium while virus from patients with colds or related infections is not pathogenic for ferrets and has been cultivated only under anaerobic conditions suggests that there exist at least two different types of filtrable virus—the cold virus and the virus of epidemic influenza. Until recently the failure to adapt cold virus to small laboratory animals has prevented any immunologic proof of such a dissimilarity. However, in the past year we succeeded in establishing a disease in mice by intranasal inoculation of cold virus growing in the chorioallantoic membrane of the chick embryo. This disease was characterized by areas of pulmonary consolidation and was fairly readily transmissible in series, although it did not carry so high a mortality rate as disease due to influenza virus in mice. Preliminary studies¹⁶ with immune serums were apparently showing an immunologic dissimilarity between cold virus and influenza virus when the course of the experiments was interrupted by the appearance of a new and highly fatal virus which became mingled with all the strains of cold virus and abruptly terminated the experiments. This new virus was found later to be present occasionally in the lungs of apparently normal mice and to undergo a rapid enhancement of virulence on repeated intranasal passage, a fact which makes great caution necessary in interpreting results obtained with such a technic.

The objective of all this work, naturally enough, has been the development of some satisfactory means of prophylaxis against infection of the upper respiratory tract in human beings. Our hope has been stimulated by the successful vaccination of certain animals against virus infections such as canine distemper and, more especially, swine influenza. The latter disease furnishes somewhat of an analogy to infection of the upper respiratory tract in human beings, for it has been clearly shown by Shope¹⁷ to result from the combined activity of a filtrable virus and a bacterium, *Haemophilus influenzae suis*, resembling the bacillus of Pfeiffer in man. Although this bacterium is necessary to produce the full clinical severity of the disease, it is powerless to initiate it, and Shope discovered that a solid active immunity could be generated in swine by parenteral injection of living virus alone. Believing as we did that the cold virus was similarly the agent of primary etiologic importance in human colds, we hoped to be able to create an active immunity in man by the same method. Having developed a technic for the production and preservation of cold virus which rendered it available at all times and in a condition of proved bacteriologic sterility, we were in a position to attempt such an experiment. After a preliminary trial with chimpanzees, which yielded encouraging evidences of

active immunity, several groups of human beings were given subcutaneous injections of living virus. Careful study of their subsequent clinical histories failed to reveal any real evidence that protection against colds had been developed by this means. The explanation of this negative result cannot yet be made—whether it is due to the existence of a multiplicity of strains of virus, to the impossibility of preparing virus in large quantities free from the constituents of the nutrient medium or to the possibility that resistance to colds is a purely local rather than a general bodily phenomenon. In any case, these early attempts must be regarded as failures, although this does not prove that with some future modification of technic the enterprise may not be successful.

With regard to the prophylaxis of influenza, the situation may be regarded as more encouraging. Francis and Magill¹⁸ have reported the production of immune substances in the serum of persons vaccinated with a mouse passage strain of influenza virus cultivated in tissue medium. More recently Stokes and his associates¹⁹ have described what appears to be active immunity in a group of persons similarly treated.

The foregoing is a brief summary of researches which have been carried out in several laboratories during the past decade, and it is obvious that the problems studied are as yet remote from practical solution. Nevertheless, it seems fair to assert in conclusion that a certain amount of progress has been made—that light has been shed on complex mechanisms and that methods have been developed which may have future value.

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ABSTRACT OF DISCUSSION

DR RUSSELL L. CECIL, New York. To a practitioner the respiratory infections are of intense interest because they make up such a large part of practice. One of the most interesting phases is "virus pneumonia" which occurs in ferrets and mice and which usually is not associated with any secondary infection with pathogenic cocci. It leads one to speculate as to just how often in severe, fulminating influenza in man there exists first a virus pneumonia before the secondary invaders make their appearance. I have not seen at autopsy a virus pneumonia in man, but that might be explained in various ways. When one sees influenza virus pneumonia in the ferret one wonders whether in 1918 a great deal of the pneumonia was not primarily a virus pneumonia, with bacillus influenzae, streptococcus, and pneumococcus acting as secondary invaders. Practitioners know but little about the technical side of viruses but are tremendously interested in any efforts toward vaccination with viruses and regret to hear from Dr. Dochez and his co-workers that first experiences with cold virus vaccine have been disappointing. I feel as they do that the question is just beginning to be studied and that much more work will have to be done before the possibilities of an effective cold virus vaccine can be dismissed. The old coccus vaccines which many take in wintertime in the hope that they will give some protection are not entirely without benefit. For many years I have used these vaccines, as made up by the commercial houses and occasionally autogenous vaccine and it is surprising how in some people they give definite protection. The authors' work showed that while the ordinary coccus vaccine did not give protection in young children it gave them a milder type of cold. The colds were less severe and less frequently followed by complications such as otitis, mastoiditis and pneumonia. It may be found that by combining a virus vaccine with a coccus vaccine better results will be obtained than with either of these vaccines alone. Dr. Francis Blake and I, during the war, swabbed the noses and throats of monkeys with freshly

16 Dochez, V. R., Mills, Katherine C. and Mulliken, B. *Proc. Soc. Exper. Biol. & Med.* 36: 683 (June) 1937.
17 Shope, R. E. *J. Exper. Med.* 54: 373 (Sept) 1931.

18 Francis, Thomas Jr. and Magill, T. P. *Proc. Soc. Exper. Biol. & Med.* 33: 604 (Jan) 1936.
19 Stokes, Joseph Jr., Chenoweth, A. D., Waltz, A. D., Gladen, R. G. and Shaw, Dorothy. *J. Clin. Investigation* 16: 237 (March) 1937.

isolated Pfeiffer bacilli. They got a respiratory infection and they got it without any preliminary virus infection. It was not, however, a perfect imitation of influenza in man. It was not so severe, though one or two monkeys got secondary pneumonia and pansinusitis. Dr. Blake and I were misled at that time into believing that the influenza bacillus was probably the cause of the pandemic. The work on viruses has shown that we were wrong in that contention. It is rare to see either rheumatic fever or acute arthritic infections without a preceding respiratory infection, and it looks as though the hemolytic streptococcus was the organism usually implicated in these cases. There is the cycle of influenza attack, secondary invasion with hemolytic streptococci and finally the metastatic or allergic manifestations in the joints.

DR L. D. BRISTOL, New York. In the Bell Telephone System during the last fifteen or twenty years about 20,000 employees, largely through the cooperation of their family physicians, have been given the so-called cold vaccines. Our experience has been that they haven't prevented colds but that they have definitely cut down length of disability in many instances, and that in industry is a primary objective.

DR HENRY F. VAUGHAN, Detroit. There is little I can add to what Dr. Cecil has said. I might refer to the fact that in the outbreak at Camp Wheeler there was an epidemic of type I pneumonia quite specific in type, which preceded the inoculation with the specific types I, II and III pneumococcus vaccine. Following that outbreak of pneumonia which included a series of ninety deaths (the results have never been published but they are a matter of record in the Surgeon General's Office), there was no more pneumonia of that type. What impressed us especially was the widespread, numerous type I pneumonias. That was as fulminating an epidemic as I have ever seen, influenza, smallpox or any other communicable disease, but after the vaccination had been performed on the raw troops and those already in the camp there was no more pneumonia of that type, but on top of that came the complication of the epidemic of influenza, and the armistice came too soon to complete the work. We have often wished the armistice had been delayed slightly, so that we could have accomplished more work.

DR M. L. BLATT, Chicago. I am wondering, after listening to the admirable discussion of Dr. Dochez and his co-authors, whether they might not have had better results in protection against the common cold if this infection were as accurately defined as influenza is defined. Many who practice pediatrics find other diseases diagnosed as a common cold. Cases so diagnosed are food, pollen or bacterial allergies. Some are old sinus infections which recur and a number are of the so-called histamine type—a rhinorrhea brought on by drafts or exposure. One of the greatest difficulties in the careful evaluation of virus vaccination against the common cold will result from the difficulty in diagnosis. With influenza, however, the picture is quite different. It is a recognized entity. It is not confused with streptococcal nose or throat infections. Influenza is a three day infection easily diagnosed in the presence of an epidemic and usually when endemic if white blood counts are made. With regard to the coccus vaccines in childhood, I have had good results from the use of lysed coccal vaccines at the St. Vincent's Orphanage during the past five or six years. The institution houses infants up to 3½ years, between 150 and 200 at all times. I have found that the use of this vaccine has resulted in a decrease in complications, but the incidence of nasal discharge has not been influenced. The same number of so-called colds occurred in the inoculated and the control group. I believe our hope rests in the use of the virus, but a more important thing is that the "common cold" be more clearly defined. Must one not consider meteorological changes as well as a virus carrier in the Spitzbergen episode?

DR YALE KNEELAND JR., New York. The defense of the common cold as an entity is a difficult one. It is perfectly true that the symptoms of allergic rhinitis are often indistinguishable from those of a flareup of chronic sinusitis or the common cold. Furthermore, there is no question but that there are numerous extraneous factors having nothing to do with infection, which can play a role, such as alterations in the physical environment. Looking at the problem in a very broad general way, one is inevitably brought back to the

experience of the observers who have made really careful studies of small, isolated communities. I think the clearest of those studies was the one made by Paul and Freese in Spitzbergen, where, in a population of about 500 persons exposed to the severities of the subarctic winter there were no colds during a period of seven months when the harbor was icebound and the community physically isolated from the outside world. When I say there were no colds, that is not strictly true. There were four, three occurring in the same person, who was thought to have a chronically infected sinus, and one occurring spontaneously in another person. There was no evidence that these four clinical episodes were communicable diseases. However, within seven days after the arrival of the first boat in the spring there were 125 examples of acute upper respiratory infection among the population. Bacteriologic studies made throughout the entire winter, during the spring when the first boat came, and during the outbreak showed no significant alteration in the flora, and the observers were unable to identify any new organism as having been introduced. The inevitable conclusion is that while these other factors undoubtedly have a role of considerable importance there is one essential factor—the virus—without which the whole structure doesn't exist in the form in which we know it. That is as far as we can go in defining colds. As to carriers, our own attempt consisted of one experiment in which we studied a number of normal persons in the summer. We found none of them to be carriers of virus. We have made no other studies ourselves. It would be of enormous importance to determine that point. As to a sudden weather change being responsible for the Spitzbergen outbreak, that is a possible point of argument. There is no way of proving that changes in atmosphere, barometric pressure and the like, associated with the ice going out were not influential. However, my feeling is that meteorological changes exert a significant influence only in a system where the virus is present.

ENDEMIC TYPHUS FEVER IN NATIVE RODENTS

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AND

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Endemic typhus fever was first recognized in the Southern states in Atlanta, Ga., in 1913 by Paulin.¹ It was reported from Charlotte, N. C., in 1914 by Newell and Allan,² from Galveston, Texas, in 1916 by McNeil³ and from southern Alabama in 1923 by Macey and Havens.⁴ In the next few years, largely through the work of Macey,⁵ it became evident that this form of typhus fever was widespread in the states of the South, from the Atlantic seaboard to the lower Rio Grande Valley. In discussing the geographic distribution of the disease in 1929, Macey⁶ recognized the presence of endemic typhus in nearly all the seaports of this area and noted in particular that, while an "occasional case has been reported from the interior of the country, that section has been for the most part strikingly free." This author⁷ also noted that the majority of cases occurred in the cities and towns, with practically no cases occurring in strictly rural districts.

From the National Institute of Health.
Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 9, 1937.
1 Paulin J. E. South M. J. G. 36 (Jan.) 1913.
2 Newell L. B. and Allan William South M. J. 7 564 (J. 1914).
3 McNeil H. L. Texas State J. Med. 12 188 (Aug.) 1916.
4 Macey K. F. and Havens L. C. Am. J. Trop. Med. 3 45 (Nov.) 1923.
5 Sinclair C. G. and Macey K. F. Pub. Health Rep. 40 (Feb. 6) 1925.
6 Macey K. F. and Havens L. C. Pub. Health Rep. 41 1735 (July 19) 1927.
7 Macey K. F. Pub. Health Rep. 41 2967 (Dec. 24) 1927.

The urban character of endemic typhus was also stressed by Runreich⁸ in his differentiation of cases of Rocky Mountain spotted fever from cases of typhus in the Eastern states in 1931.

From the time of recognition of the fact that typhus is not unusual in the South until 1932, there was a gradual increase in the number of cases recognized each year. Thus, in 1922 fifty cases were reported, and each succeeding year showed a small increase until 250 cases were reported in 1929, 500 in 1930 and 300 in 1931. This ten year period (1922 to 1931) showed the increase in cases that one might expect from an increased recognition of the disease by physicians. In 1932 the number of cases increased sharply to 831, the figures for the next three years were 1,922, 1,308 and 1,195, respectively. With the increase in the number of cases, the disease apparently lost something of its essentially urban characteristics. This was remarked on by Baker, McAlpine and Gill,⁹ who noted in 1935 that much of the typhus in Alabama was in purely rural areas. These writers also reported that the rural cases were among people who could have obtained their infection only at home. This is in contrast to the increased prevalence of the disease among workers in food-handling establishments noted by Macy⁷. Furthermore, Rumreich,¹⁰ in speaking of the increasing prevalence of cases in rural and semirural areas, voiced the suspicion that the disease might have become established in animals other than the common rat. He noted occasional cases occurring under conditions which did not suggest rats as a causative factor and indicated the probability that some other animal might be acting as a reservoir of the virus. These observations led him to inaugurate studies, in cooperation with the Alabama State Board of Health and the Rockefeller Foundation, to determine the susceptibility to typhus of animals that were native in the typhus-infected sections. These studies were begun in Montgomery, Ala., but were later moved to the field laboratory of the United States Public Health Service at Mobile, Ala., where they are now being carried on.

Beginning with Nicolle's¹¹ successful infection of monkeys in 1909, many animals have been found by various workers to be susceptible to infection with typhus, either of the epidemic, or louse-borne, type or of the endemic, or flea-borne, type. Nicolle transmitted typhus to the chimpanzee and to *Macacus sinicus*. Later, Anderson and Goldberger¹² reported that they were able to infect *Macacus rhesus*. In 1911 Nicolle¹³ reported the infection of the guinea pig and in 1915 of the rabbit¹⁴. Some ten years later the gray rat¹⁵ and the white rat, the white mouse and the gerbil¹⁶ were added to the list by the same author. *Spermophilus* (*Citellus citellus*) were found susceptible by Lepine,¹⁷

a finding that was confirmed by Combesco¹⁸ and by Jelin and Grossman.¹⁹ Squirrels (*Xerus [atlantoxerus] getulus*) were successfully infected by Blanc and his collaborators,²⁰ while dogs were shown by Combesco and Angelesco²¹ to have inapparent infections when inoculated with typhus virus, and Lepine²² found that cats were susceptible, often showing no sign of the infection. Bruynoghe and Jadin²³ tested the susceptibility of certain rodents to typhus. They found meadow mice (*campagnols*, *Arvicola arvalis*) and dwarf mice (*souris naines*, *Mus minutus*) susceptible, but failed to infect wood mice (*mulots*, *Mus sylvaticus*) and garden mice (*lerots*, *Myoxus nitela*). Ronse,²⁴ however, succeeded in infecting garden mice and wood mice and also hedgehogs (*herissons*) and pigeons. Ronse did not give any specific names.

In America, Dyer²⁵ found the woodchuck (*Marmota monax monax*), the house mouse (*Mus musculus musculus*) and two species of wild mice, the meadow mouse (*Microtus pennsylvanicus pennsylvanicus*) and the white-footed mouse (*Peromyscus leucopus noveboracensis*), susceptible.²⁶ The susceptibility of the woodchuck is apparently of academic interest only, so far as a possible relationship to the endemic typhus now present in this country is concerned, since this rodent does not inhabit the sections where typhus is prevalent. Of the groups of mice to which the two species of wild mice used by Dyer belonged, the *leucopus* group of white-footed mice is absent from the area of greatest incidence of typhus fever, while the meadow mouse is represented by several subspecies.²⁷

In the investigations carried out in Alabama by one of us (Brigham) animals, chiefly rodents, were trapped in southern Alabama, principally in the southeastern counties—Houston, Dale, Henry and Geneva. These rodents were then taken to the typhus research laboratory in Mobile and tested for susceptibility to typhus. In this work the strain of endemic typhus known as the Wilmington strain was used. This strain was originally recovered by Macy²⁸ from a human being with the disease in Wilmington, N. C., in 1928. Testicular washings from guinea pigs infected with the Wilmington strain were used as a source of virus to infect the native animals. The testicles were removed from infected guinea pigs on one of the first three days of fever, usually the second or third, and washed with about 20 cc of 0.85 per cent sodium chloride. The animals to be tested were then inoculated intraperitoneally with a variable amount of the washings, usually from 0.25 to 0.5 cc for the smaller rodents. The larger rats were given 1 cc and such animals as the opossum, cat and raccoon from 6 to 7 cc. Fresh guinea pigs were inoculated with some of the same material at the same time to prove its activity. At varying periods after the infecting inoculation usually about ten to eighteen days, the test animal was killed and the brain removed. The

⁸ Rumreich A. Dyer R. E. and Badger L. F. Pub Health Rep 46 470 (Feb 27) 1931

⁹ Baker J. N. McAlpine J. G. and Gill D. G. Pub Health Rep 50 12 (Jan 4) 1935

¹⁰ Rumreich A. Proceedings of the 32d Annual Conference of the State and Territorial Health Officers with the Public Health Service June 7 and 8 1934

¹¹ Nicolle C. Compt rend Acad d sc 149 157 (July 12) 1909

¹² Anderson J. F. and Goldberger J. eph. Pub Health Rep 24 1941 (Dec 24) 1909

¹³ Nicolle C. Conseil E. and Conon A. Compt rend Acad d sc. 152 1632 (June 6) 1911

¹⁴ Nicolle C. and Blaizot L. Compt rend Acad d c 161 646 (Nov 25) 1915

¹⁵ Nicolle C. and Lebailliv C. Compt rend Acad d sc. 168 800 (April 14) 1919

¹⁶ Nicolle C. Arch Inst Pasteur de Tunis 14 149 (March 20) 1925

¹⁷ Lepine Pierre. Compt rend Acad d c 195 189 (July 11) 1937

¹⁸ Combesco D. Bonciu C. Stamatenco S. and Combesco N. Compt rend Soc de biol 113 499 1933

¹⁹ Jelin W. and Grossman J. Arch f Schiffs u Tropen Hyg 37 346 (July) 1933

²⁰ Blanc Georges. Noury M. and Baltazard M. Compt rend Soc de biol 115 8 1934

²¹ Combesco D. and Angelesco J. Compt rend Soc de biol 113 497 1933

²² Lepine P. and Lorando N. Bull Soc path exot 28 356 (May) 1935

²³ Bruynoghe R. and Jadin J. Arch internat de med exper 8 513 (Nov.) 1933

²⁴ Ronse Marguerite. Compt rend Soc de biol 115 755 (Jan 27) 1934 116 358 (April 28) 1934

²⁵ Dyer R. E. Pub Health Rep 10 723 (June 22) 1934

²⁶ These animals were supplied by the Bureau of Entomology United States Department of Agriculture

²⁷ Anthony H. E. Field Book of North American Mammals New York G. P. Putnam's Sons 1928

²⁸ Macy K. F. Pub Health Rep 44 589 (March 15) 1929

brain was then ground up in a sterile mortar and, after suspension in a few cubic centimeters of saline solution, was injected into male guinea pigs. Two guinea pigs were regularly used for this test, each guinea pig receiving one half of the suspended brain when small rodents were under test. When larger animals were being tested, about 4 cc of a heavy brain suspension was injected. The inoculated guinea pigs were observed daily for rise in temperature and scrotal lesions indicative of infection with typhus. When either of these indications developed, the guinea pigs were killed and their organs used to perpetuate the virus in other animals. The identity of all strains of virus recovered from inoculated native animals was judged by the usual criteria—clinical picture in guinea pigs, presence of Rickettsiae in smears from the tunica, production of agglutinins for *Bacillus proteus* OX₁₉ in rabbits, development of typical histologic changes in the brain and a definite and complete cross immunity with the stock strain.

When the foregoing criteria were used, the following animals²⁹ were found to be susceptible: opossum (*Didelphis virginiana*),³⁰ old-field mouse (*Peromyscus polionotus polionotus*), cotton mouse (*Peromyscus gossypinus gossypinus*), golden mouse (*Peromyscus nuttalli aureolus*), wood rat (*Neotoma floridana rubida*), cotton rat (*Sigmodon hispidus hispidus*), rice rat (*Oryzomys palustris palustris*) and flying squirrel (*Glaucomys volans saturatus*). The virus was also successfully passed through a young cat, confirming Lepine's observations. Several attempts to infect raccoons failed.³¹ The opossum used in this experiment was not identified as to subspecies, but since the animal was trapped about fifteen miles north of Mobile it was most likely a Florida opossum (*Didelphis virginiana pigra*). This subspecies occurs in Florida and along the Gulf Coast to western Louisiana.

The geographic distribution of the groups used in these experiments may be said to cover in general the area of greatest incidence of typhus in the United States. However, the susceptibility of these animals to laboratory infection and their presence in the area where endemic typhus occurs only indicates the possibility of their actually serving as a reservoir of the disease in nature.

During the period when the studies on the susceptibility of native rodents have been carried out at the laboratory in Mobile, repeated attempts have been made to recover the virus of endemic typhus from animals found in the area where typhus was showing its greatest rural incidence. For this work, as opportunities offered, traps were set on the farms where typhus had recently occurred or was present at the time. It was found that if a reasonable price was offered a number of animals greater than could be handled in the laboratory could be procured without difficulty. These animals, mostly small rodents, were brought in from time to time and kept in glass battery jars until they were killed in the attempts to recover typhus virus.

In this search for typhus virus, the brains of the wild rodents were removed and, after being ground in a mortar and suspended in salt solution, were injected into guinea pigs by the peritoneal route. To reduce the chances of introducing extraneous infections, the brains of rodents were not pooled, but each brain was kept

separate and approximately half was injected into each of two guinea pigs. Therefore, few guinea pigs were lost as a result of other infections, and it is felt that the presence of the virus in any of the examined rodent was not overlooked. Daily temperatures were taken of all guinea pigs so inoculated for at least eighteen days after inoculation, and those that showed no sign of typhus infection after inoculation were later tested for immunity to the stock Wilmington strain of endemic typhus. No guinea pig so tested showed evidence of immunity.

On Sept 7, 1936, an old-field mouse (*Peromyscus polionotus polionotus*)³² was trapped on a farm in the western part of Houston County, in southeastern Alabama. The mouse was received at the laboratory two days later and placed in a battery jar with five other old-field mice which had been trapped at the same location. As the supply of guinea pigs and the press of other work permitted, these mice were removed from the jar and killed one by one. Thus, two mice, 86 and 87, were killed on October 16, two, mice 91 and 92 on October 29, and two, mice 93 and 94, on November 5, and their brains inoculated separately into guinea pigs. The guinea pigs which received the brains from mice 86, 87, 92 and 94 and one of the guinea pig receiving brain material from mouse 91 showed no subsequent signs of infection and when later inoculated with the stock strain of typhus had typical attacks of typhus. The second guinea pig, inoculated with the brain material from mouse 91, had a febrile reaction on the fifteenth day after inoculation. On the fifth day of this reaction the guinea pig was killed and some of its blood and all of its brain used to inoculate four fresh guinea pigs. These four guinea pigs failed to show any signs of typhus and were later found to be nonimmune.

Both of the guinea pigs which were inoculated with the brain from mouse 93 had febrile reactions on the sixth day subsequent to inoculation and scrotal swelling typical of endemic typhus, two days later. By transfer of blood and testicular washings from one of these guinea pigs, the strain was perpetuated and has been maintained in laboratory animals to date. Up to the present time this strain has been passed through 102 guinea pigs in twenty-five transfer generations. Of these animals eighty-seven have given a typical clinical picture of uncomplicated endemic typhus, eight have shown fever and only transitory scrotal involvement, two have shown fever only and five have died of intercurrent infections.

Comparison of the strain isolated from the field mouse with the Wilmington strain of endemic typhus showed no differences. In guinea pigs, the clinical reactions produced, the presence of Rickettsiae in smear from the tunica vaginalis and the character of microscopic changes in the brain³³ were in all respects similar to what has been recorded for other typical strains of endemic typhus. In addition, agglutinin were produced for *B. proteus* OX₁₉ in rabbits after inoculation with the field mouse strain, and complete cross immunity was observed between this strain and the Wilmington strain.

The field mouse from which the typhus virus was recovered was trapped in the western part of Houston County, Ala., this county being in the southeastern corner of the state. The mouse was trapped in a field that had not been under cultivation for several years.

²⁹ Identification through the courtesy of the Division of Mammals of the National Museum.

³⁰ Brigham G. D. Pub. Health Rep. 51:333 (March 27) 1936.

³¹ Brigham G. D. Pub. Health Rep. 52:660 (May 21) 1937.

³² Brigham G. D. Pub. Health Rep. 52:659 (May 21) 1937.
³³ All histologic examinations of brains were made by D. E. Lillie, National Institute of Health.

at a location about one quarter of a mile from the nearest house. Thirteen other houses occupied by white tenants were within a radius of 1 mile of the location where the mouse was caught. No cases of typhus had occurred among the residents of these houses for the past five years. Outside a radius of $1\frac{1}{2}$ miles and within a radius of 6 miles, thirty cases have occurred within five years. Four of these occurred among the inhabitants of a small town of 300 people. The remaining twenty-six cases were strictly rural. This particular section of Houston County is close to the border of Houston and two other counties, Dale and Geneva. These three counties have reported a total of 639 cases in the past five years, at least one third of which are classed as rural cases. The typhus-infected mouse was the eighty-seventh wild rodent examined for infection since the inauguration of the work in our Mobile laboratory. The recovery of the virus of endemic typhus from a wild mouse from this area suggests a possible explanation for the occurrence of so many rural cases, but, with the presence of other susceptible species of animals in the same area, the possibility of other reservoirs must be admitted.

SUMMARY

The incidence of endemic typhus fever in the southeastern part of the United States has increased, and there is a tendency toward a spread of the disease from the original foci in towns to the rural districts.

Eight species of animals, chiefly rodents native in the typhus-infected sections of the United States, are susceptible to typhus fever.

The virus of endemic typhus fever was recovered from a native rodent trapped in a rural section of Alabama.

Twenty Fifth and E streets

ABSTRACT OF DISCUSSION

DR JOHN J PHAIR, Baltimore. The substantiation of Rumreich's premise that the typhus fever virus may become established in animals other than the common rat, by the finding of the virus in a field mouse, is interesting. It indicates at least that the spread has begun and, when this is coupled with the further observations on the susceptibility of other animals, it will apparently have a fertile field in which to work. The typhus fever found in the endemic areas of the Southern states does not present the serious aspects that are common in the Old World type found in the colder zones where the disease is louse borne. It has a relatively mild clinical course and low fatality. The epidemiology of the disease has also some significant differences. However, the disease with its implications to the public presents questions that the public health workers of those areas must be able to answer. The usual answer, to eliminate the rat population, does not suffice for Southern rural communities. Rat eradication is an exceedingly expensive and laborious undertaking even in an urban community and is practically impossible in a rural area. It must be a continuous and unrelenting warfare and the effort cannot be relaxed after one or more sporadic drives. Furthermore, this sort of service is beyond the powers of health departments of most of the areas in question at the present moment. Further work of the type that Dyer and his associates are doing is needed. We need rat surveys that will give adequate data to show the relationship between the number of rats in a community, the number infected and the amount of typhus. Rat control rather than rat eradication probably will be the method that will be most efficient in other words, it might not be necessary to secure complete eradication but rather work toward a rat population level that would not be great enough to cause transmission of the virus. Rat control is a service that might be possible with the

resources of the average health department. Rodent eradication is impossible, as health agencies cannot poison the entire wild life of a rural area.

DR J N BAKER, Montgomery, Ala. This paper is one naturally of considerable interest to any health officer in the South. It is of particular interest to me, coming from the state where a great deal of this experimental work is going on. Dr Phair referred to the futility of rat eradication programs. This is true. It must be a relentless warfare and it must be a persistent one or else interest lags in the long run. When this happens, the problem is soon likely to revert to the status quo ante and no permanent gains are made. He also spoke of the possibility of health agencies, either in the state or in municipalities, trying to design programs thinking in terms of permanence so far as rat control is concerned. That is, the application of modern rat-proofing methods. That is the sound method of approach, if lasting results are desired. Several years ago, when Alabama first undertook an eradication program seriously throughout the southeastern portion of our state we were able to have killed an enormous number of rats throughout the infected area, and we could see reflected a rather pronounced decrease in the incidence and in the mortality rate of the area, however, because of financial stringencies the program slackened considerably, with a resulting increase in the incidence of cases in the succeeding year. We now have set up in our central organization a control program of rat eradication through rat proofing, coupled with rat extermination, under the direction of a physician who has been well trained by the Public Health Service in the techniques of the rat proofing of buildings. We are attempting to get as much of the new construction as possible going on in this area properly and scientifically rat proofed. As a consequence, in Mobile, Montgomery and several other municipalities we have made real progress in educating the public to the importance of rat proofing new structures and remodeling and revamping old structures to make them rat proof. I would suggest that other state health officers think in terms of setting up some such program. A significant fact regarding the incidence of endemic typhus both in Alabama and in Georgia is the almost exact coincidence of the areas involved with the peanut growing sections of these states. The growing of the peanut in southeastern Alabama and through the central segment of Georgia, projected on the Atlantic seaboard, is an important agricultural pursuit, and it is in these areas that most of our typhus occurs. However, more recently we have found that typhus has shown some tendency to spread to some of the more northerly counties, as several cases have been reported from Birmingham, in Jefferson County, where rat eradication and control programs have been begun.

DR J C GEIGER, San Francisco. In our port city the U S Public Health Service many years ago initiated the rat proofing of buildings because of bubonic plague. At that time there was developed what was called a model rat proofing ordinance for buildings. This is still in effect. Such a measure is expensive, but it is a necessity. That it has delimited the rat population in San Francisco cannot be doubted. The problem of rat control in large cities and its relation to human disease is not limited to one disease. Bubonic plague is still a vexatious problem in California. San Francisco has not had a positive plague rat since 1903, and our control measures against the rat have been continuous. These control measures have been conducted by the U S Public Health Service and partly paid for by the department of public health. There are other problems regarding rats that are equally important to cities. Workers in San Francisco have investigated the problem of trichinosis and the relationship of the rat. More recently, Weil's disease has likewise come under scrutiny. In the vicinity of one case of Weil's disease reported in San Francisco there were found approximately 33 per cent of rats infected with spirochetes. It cannot be doubted that because of its association with plague, trichinosis and Weil's disease, the rat is becoming a greater menace to the public health of large cities and quite expensive to the department of health in establishing control measures. I have increased my rat-catching forces 100 per cent this year because of the presence of Weil's disease. Plague in connection with rats in California has not

been forgotten, but scientific interest has been transferred to ground squirrels and other rodents. San Francisco had an outbreak of trichinosis several years ago. Investigation of the disease was done intensively and because of this San Francisco is regarded as one of the ports in the United States in which trichinosis is quite prevalent. It behooves the departments of health of other cities to investigate this public health problem. The departments of health of cities should have a definite rat control program and a technical knowledge of the examination of rats for the series of diseases which they are assisting to transmit to human beings today. It would appear that plague is moving toward the eastern part of the United States and across the mountains, being now demonstrable in Utah. With cities like Chicago in its path, there are public health problems of the highest magnitude with regard to rats and plague and other diseases. Therefore, cities of the United States, both inland and coastal, must give to these problems every consideration.

DR. G. H. COOMBS, Augusta, Maine. Four years ago a competent clinician decided during the convalescence of a patient living in an isolated section of the country, eight miles from the nearest village, that it must have been a case of endemic typhus. He still sticks to his conclusions. The only specimen of blood from this patient was obtained some four weeks after convalescence was established, when it came to my attention, and it was negative. This patient attended Holy Roller meetings in a nearby village situated at the mouth of one of our tidewater rivers, where the coal barges came in for the northern portion of the state, the coal being unloaded there. These meetings were the rendezvous for the roustabouts on the coal barges. There is a possibility there. The ice goes out of this particular river late in March. About six weeks ago one of our field workers was investigating an outbreak of scarlet fever. He was asked by the attending physician to see another case with a consultant. Diagnosis was held up because of its peculiar history. A man, aged 30, a laborer in a large manufacturing establishment on the tidewater section of the river, which received its coal from the Southern states, had a mild elevation of temperature, headache, backache, and a diffuse, macular, darkish red rash. The patient's blood was sent to the National Institute of Health, and the report was agglutination of 1 to 10 for tularemia and 1 to 80 for *Bacillus proteus* X₁₀. A second specimen at the end of ten days was reported as positive in an agglutination of 1 to 40 for *Bacillus proteus* X₁₀. We are engaged in a situation of watchful waiting. We feel that if there is some work we can do early we wish to do it. I am in hopes from this discussion and what I may learn on this trip to have some constructive ideas as to what we may do to control this situation.

DR. JAMES A. HAYNE, Columbia, S. C. We have had typhus fever in South Carolina for some time. About four years ago an interesting paper was written by Dr. Mood of Charleston concerning sixty cases that occurred at Roper Hospital in that city. Each year a number of cases are reported, and last year 150 cases were reported. I am sorry to think that there are other sources of infection besides the rat, because we have all sorts of rodents in South Carolina and, it we are going to have something besides the gray rat to look for, we have more to do than we think we have at the present time. It is probable that there is a great deal more typhus fever in South Carolina than is reported. We made Weil-Felix tests on every specimen of blood sent in for a Widal test, but the physicians often send the specimens in such manner that we are unable to make the tests. The education of physicians in South Carolina as to laboratory methods seems still to be in the dark ages. They seem to forget as soon as they get out of medical school that there are such things as laboratory terms. They ask for typhoid vaccine when they mean typhoid bacterin and they ask for smallpox serum when they mean smallpox vaccine.

DR. JOHN A. FERRELL, New York. The study reported by Drs. Brigham and Dyer has been of particular interest to the health authorities of the country. I had not previously been fully acquainted with the scope of the study or with the results. Just as this study is of deep interest to the Southeastern states,

studies being made by the Public Health Service in conjunction with the Northwestern states relative to sylvatic plague and Rocky Mountain spotted fever are extremely important to that region. As cases of these diseases have occurred beyond the international boundary, the western provinces of Canada are giving consideration to studies intended to determine to what extent these diseases have spread to Canada and as to whether or not they constitute a real public health menace to which Canada and its provinces should direct control measures. The public health organizations everywhere are in need of information which such studies may furnish for guidance in administrative matters.

THE TREATMENT OF PRIMARY CARCINOMA OF THE MALE URETHRA

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Carcinoma originating in the male urethra has always been considered a relatively rare disease. The first authentic case was reported by Hutchinson¹ in 1861. Bierbaum² fifty-one years later was able to collect only forty-nine cases from the literature. Goldstein and Abeshouse³ in the early part of this year stated that up to the present time 112 cases had been described.

We have made a thorough search of the literature on this subject and have found 143 reported cases. Many of these had not been mentioned by any authors since their original publication. We have abstracted and tabulated each case history.

The object of this paper is to enumerate the various types of treatment used and to emphasize those giving the best results. This paper also includes two new cases, making a total of 145 reported to date.

In reviewing the histories, it was evident that the site of origin of the growth could not be accurately determined in many instances, as the malignant process had spread beyond its original source at the time the patient was first seen. This was particularly so when the bulbous or the membranous portion of the urethra was involved.

For clinical purposes therefore we have listed the growths into two main groups, depending on their location. In the first group are those occurring in the anterior, or penile, portion of the urethra, and in the second are those found in the bulbomembranous, or posterior, portion. Anatomically, the bulbous portion is not a part of the posterior portion. We have included it because the symptoms and physical signs of tumors located there are the same as those of growths occurring in the prostatic and membranous portions. From a study of the end results it is apparent that this arbitrary division is a perfectly rational one.

ANTERIOR PORTION OF THE URETHRA

In sixty of the 143 cases studied, the carcinoma occurred in the anterior portion of the urethra. Various methods of treatment were used, such as (1) partial or complete amputation of the penis, (2) total or partial

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Read before the Section on Urology at the Eighty-Eighth A. M. A. Session of the American Medical Association, Atlantic City, N. J., June 10, 1937.

1. Hutchinson. Tr. Path. Soc. London 13: 167, 1861.
2. Bierbaum, J. Inaug. Dissert. Leipzig 1912.
3. Goldstein, A. E. and Abeshouse, B. S. Ann. Surg. 105: 113, (Feb.) 1937.

emasculation, (3) x-ray treatment of the inguinal glands, (4) application of radium to the growth, (5) resection of the urethra and the growth (6) external urethrotomy and (7) inguinal adenectomy in conjunction with one of the aforementioned forms of treatment

Amputation of the penis, either complete or partial, was the treatment most often used. It was performed on twenty-nine patients, resulting in twenty-six recoveries and only three deaths. Treatment with radium or x-rays without surgical intervention was used on three patients,⁴ two of whom were cured.

When the growth is limited to the distal anterior portion of the urethra, that is, the part in the region of the glans penis, partial amputation can be safely employed. If, however, the malignant process is in the shaft of the penis, near the bulb, and particularly if the corpora cavernosa are involved, it is best to perform radical amputation.

Emasculation is a needless operation and should never be done, as the testicles are not invaded with metastasis. Urinary infiltration of the scrotum due to rupture of the urethra has been reported. This may have led some surgeons to perform total emasculation.

It is surprising to note that of the sixty patients in whom the anterior portion of the urethra was involved thirty-four, or 56 per cent, recovered, fifteen, or 25 per cent died, and in eleven cases, or 18 per cent, there was no mention of the end result.

POSTERIOR PORTION OF THE URETHRA

Seventy-eight patients had carcinoma of the posterior portion of the urethra, the growth was found most often in the bulbous or the membranous part and occasionally in the prostatic part. A study of the case histories showed many varied forms of treatment. Some no doubt were merely palliative, as the disease was too far advanced to permit constructive surgical intervention.

The different forms of treatment described were (1) suprapubic cystostomy, (2) internal or external urethrotomy, or both, (3) incision and drainage of the perineum, (4) resection of the urethra and the growth, (5) fulguration and application of radium, (6) excision of the inguinal or the deep femoral glands, (7) total emasculation, (8) passage of sounds and (9) use of an indwelling catheter.

In this series of seventy-eight patients only eleven, or 14.3 per cent, recovered, while fifty-eight, or 74.2 per cent, died. In nine cases, or 11.5 per cent, there was no mention of the end result.

The operation which gave the greatest number of cures was resection of the urethra with the included growth. This was performed in five of the eleven cases. In one of the five the inguinal glands were also removed, in a second the penis was amputated and in a third radium was applied postoperatively.

In contrast to the gratifying end results obtained in the treatment of growths involving the anterior portion of the urethra, carcinoma of the posterior portion presents a gloomy picture. This is no doubt due to the fact that there are no characteristic symptoms of this disease. The patients are treated for stricture

and its complications, such as rupture of the urethra, periurethral abscess or urinary fistula. By the time the true condition is recognized the growth has become inoperable.

Early diagnosis is essential. In studying the histories, we found it interesting that when more than one case was reported by the same author the diagnosis was made sooner in the second or third, owing to the physician's previous experience.

One should consider the possibility of carcinoma of the urethra in men after 40 who, with no previous history of stricture have the symptoms characteristic of this condition. Progressive difficulty on urination was an outstanding symptom. Hematuria occurred infrequently and then usually after instrumentation.

In patients known to have stricture, the development of periurethral swelling or periurethral infiltration of urine, with or without the formation of a fistula, should make one suspicious of malignant change. If there has been no recent instrumentation and therefore no possibility of traumatic rupture of the urethra urethros-copy should be performed without delay. If polypoid tissue is found, a piece should be removed for biopsy.

In reviewing the entire series of 143 cases, we were interested to note that inguinal glands had been removed in only twelve cases, seven of anterior and five of posterior urethral involvement. In each instance except one the patient recovered. Of the forty-five patients in the entire series who recovered, only eleven had an inguinal adenectomy. In several patients the glands were seen on clinical examination to be enlarged. Sections after removal showed inflammatory changes but no metastasis.

Despite the fact that only approximately 4 per cent of the patients who recovered had an inguinal adenectomy, surgical intervention should include removal of the inguinal glands in order to obviate the possibility of metastasis by way of the lymphatics. Huggins and Curtis⁶ described the surgical procedure in detail, and repetition at this time is needless.

The following reports are on two patients whom we have treated in the past three years.

CASE 1—History—An Italian, aged 52, unmarried, who complained of a weak stream had been under treatment at intervals since February 1933 for a severe stricture involving the anterior portion of the urethra. Dilations were carried out to No. 30 F and the patient was discharged in December 1933 as well. He came in at intervals to make sure the strictures did not recur. In May 1936 a grating sensation was noted when a No. 28 F sound was passed. At that time the patient had no complaints. It was suspected that urinary salts had become deposited in the scarred area and urethroscope-y was performed. A papillomatous area involving the ventral portion of the urethra anterior to the bulb was observed. There was no bleeding, and the growth was circumscribed. A fragment of the growth, which broke off, was recovered and examined microscopically. The diagnosis of epidermoid carcinoma was made. Following endoscopy, a periurethral abscess developed involving the perineoserotol region. The patient was admitted to the hospital on May 15.

Physical Examination—The result was essentially negative. The inguinal glands were not enlarged or tender. The scrotum was reddened, enlarged and indurated with no tenderness except at the raphe. The testicles and the epididymis were not distinguishable. Transillumination gave negative results. The penis appeared normal. The tone of the sphincter was poor, and a mass was palpable just inside of the sphincter. The prostate was not palpable and there was no tenderness on rectal examination.

⁶ Huggins C B and Curtis G M. Surg. Gynec. & Obst. 14: 544 (April) 1929.

⁴ Wurm R, J. Urol. 24: 497-521, 1927. Watson E M. J. Urol. 21: 217 (Feb.) 1929. Diehl K. Virchows Arch. f. path. Anat. 256: 666-873, 1925.

⁵ Lower W E, Tr. A. Am. Genito-Urin. Surgeons 24: 249, 1931. Sokolov M S. Soviet Klin. 18: 265-272, 1932. Scholl A J, Jr. and Braeb W F. Ann. Surg. 76: 2-6 (Aug.) 1922. Oberlander F M. Internat. Congr. Biol. f. d. Physiol. u. Path. d. Harn. u. Sexualorg. 4: 244, 1893.

Treatment—With the patient under subarachnoid anesthesia a cystostomy was performed. A mushroom catheter was inserted and left in place. The scrotal abscess was then incised, and about 500 cc of foul-smelling pus flowed out under pressure. Digital examination with a sound in the urethra revealed the presence of a mass on the left side of the urethra and an erosion of the urethra on the right. A drain was inserted. Resection of the urethra and a first stage ureteral transplant on the right side were performed June 18. The pendulous portion of the urethra containing the growth was removed.

This necessitated resection of the bulbous portion anteriorly for about 25 cm. The patient had refused amputation of the penis. A first stage ureteral transplant after the method of Winsbury and White was then performed on the right side. It had been our intention to anastomose the ureters, but the left one could not be found at this time.

Pathologic Examination—Microscopic examination of sections of the penis showed the urethra to be irregular in outline and the normal epithelium to be replaced by stratified squamous epithelium in some regions. In other regions the epithelium was replaced by an ulcerated, irregularly proliferating squamous cell epithelioma. The regions lined by the stratified squamous epithelium showed that it had prominent rete pegs, and at the edges there was a transition into the neoplastic growth.



View showing the growth and the rent in the urethra in case 1

The neoplasm was generally composed of long thick cords or irregular club-shaped groups of cells. The central zones of these clubs frequently showed pearl formation. The cells had a large vesicular nucleus with a distinct nucleolus. The amount of cytoplasm varied according to situation. Large areas of necrosis were also present. Associated with the neoplasm was a dense infiltration of lymphocytes, plasma cells and phagocytic mononuclear elements. The neoplasm seemed to be limited to the corpus spongiosum. In the fibrous tissue separating the corpus spongiosum from the corpora cavernosa there were perivascular infiltrations of lymphocytes and plasma cells, which were also seen in the corpora cavernosa. A section in another region showed no evidence of neoplastic invasion and did not include the urethra.

A diagnosis was made of squamous cell epithelioma of the urethra, with invasion of the corpus spongiosum, and metaplasia of the urethral epithelium.

Further Treatment—August 5, with the patient under subarachnoid anesthesia, the ureteral transplants were completed. The second stage of the Winsbury-White procedure on the right side was accomplished without difficulty. A No. 8 ureteral catheter had been passed up the left ureter by means of a cystoscope passed through the suprapubic wound before the operation was begun. This greatly facilitated finding the left ureter, which was then transplanted by the method described by Hinman. Peritonitis developed, and the patient died five days later.

Autopsy—The usual midline incision was made through a very thin layer of fat and firm muscle, which in the lower

part of the abdomen followed the line of surgical incision. The omentum covered the intestine and was fixed on to the right side of the pelvis. Other adhesions to the incision to the bladder also were seen. The peritoneal cavity contained purulent fluid both free and in several sacs. The stomach, duodenum and the upper part of the jejunum were markedly dilated and partly covered with fibrinous exudate. The loops of the jejunum were adherent to one another in several places and in the upper third of the ileum the adhesions were so dense that the resulting block had caused the dilatation of the intestinal tract above this point. A fibrinous exudate and injection of the vessels of the serosa were seen throughout the colon and the sigmoid flexure. The appendix was normally situated. No alteration could be noted in the appendix. The pelvic organs were normally placed.

Genito-Urinary Tract—The kidneys, ureters, bladder, prostate, testicles, urethra, sigmoid flexure and rectum were removed *en masse*. Both ureters were surgically implanted in the lower part of the sigmoid flexure. The left ureter had its orifice in the sigmoid flexure. In the right ureter there was an orifice into it. Near the insertion of the right ureter there was a small hole in the sigmoid flexure, and around this region a marked peritonic process was seen. Both kidneys were enlarged. The capsules were easily stripped. On section of the pelvis of the right kidney, especially, was seen to be markedly dilated. Both pelvises were filled with a purulent fluid. The mucosa of the pelvis contained many injected vessels. The parenchyma of the kidneys appeared normal. No regional glands could be found.

Microscopic examination of the right lung showed nests of epithelial cells in large regions of fibrosis. These cells were of flat epithelial type, they contained a dark nucleus with pale cytoplasm. Numerous mitotic figures occurred. No pearl formation was noted. Invasion of the epithelial nests above the region of fibrosis was noted.

The diagnosis was (1) cornifying squamous cell carcinoma of the urethra, (2) metastasis to the right lung, (3) generalized peritonitis and (4) bilateral pyelitis.

CASE 2—History—A white man, aged 44, a physician, who complained of weakness of the urinary stream and pain and swelling at the base of the penis, for the past sixteen years had had difficulty on urination. He realized that his illness was due to a urethral stricture resulting from an attack of gonorrhea contracted when he was 19 years old. This stricture had bothered him a great deal, but, being of a nervous, apprehensive nature, he did not consult a physician.

During January 1934 he sought treatment because of a lithritis involving one of the glands near the base of the penis. This gland became suddenly swollen and was very tender. Poulitices of magnesium sulfate were applied, and after twelve days the swelling subsided and the pain disappeared. Attempts were then made to dilate the urethra. Between January 4 and April 1934, filiforms and tunnel sounds Nos. 8, 10 and 12 F were passed. Because of the severe strictures along the urethra and the nervous condition of the patient it was impossible to increase the size of the sounds beyond 12 F. In the latter part of April a second abscess developed at the base of the penis. Poulitices this time were of no avail, and the patient was taken to the hospital, where, while he was under gas and oxygen anesthesia, the abscess was opened. It healed in approximately three weeks without any leakage of urine through the external wound. During May 1934 the patient had great difficulty in voiding, the stream was weak and dribbling and the condition at times verged on complete retention. Therefore the patient was taken to the hospital in the early part of June and prepared for an operation to relieve the urethral stricture. During his illness he voided frequently, voiding every two or three hours and three or four times at night, with dysuria after instrumentation. He had never noticed any blood in the urine.

Physical Examination—The inguinal glands were enlarged at the first examination. Along the ventral surface of the penis four or five indurated nodules were palpable. There was a small scar at the base of the penis, which

entirely healed. On palpation of the urethra in the perineum it appeared thickened, indurated and slightly nodular. The prostate was soft, and no areas of induration in the rectum were palpable.

Operation—Anesthesia was induced by gas and oxygen. With the patient in the lithotomy position, an incision about 4 cm long was made in the perineum. The superficial transverse perineal muscles were exposed and retracted posteriorly, exposing the bulb. An incision was made through the bulb down to the urethra. The urethra was seen to be thickened, and nodules could be plainly felt on the ventral surface. An incision 1 cm long was made through the ventral surface, and the edges were caught and retracted. A mass of scar tissue was found immediately within the urethra. After some difficulty a filiform was passed from the external urethrotomy wound into the bladder. On to this filiform a urethrotome was threaded. This urethrotome, instead of having a knife blade, had a fine wire which coagulated at the same time as it cut. With the current turned on, the electrical urethrotome was passed into the bladder. After the cuts were made there was very little bleeding and it was possible to pass a No 26 sound through the wound into the bladder. After this was done a filiform was passed from the meatus down through and out of the perineal wound. The urethrotome was then threaded on this filiform four distinct cuts were made and a No 24 sound was passed through the strictured area in the penile portion of the urethra. It had been planned to resect whatever scar tissue was necessary, but after the strictured areas were cut with the urethrotome it was unnecessary to do any resection of the urethra. A No 22 Robinson catheter on a stylet was passed through the meatus beyond the external urethrotomy opening and into the bladder. The urethra was then closed with No 1 chromic interrupted sutures, and the bulb was closed in the same manner. A small rubber drain was placed opposite the bulb, and the skin was closed with dermal sutures. A suprapubic cystostomy was then performed and a No 24 mushroom catheter left in the bladder.

Course—Because of the pain produced by the indwelling catheter and the nervousness of the patient, the catheter had to be removed within twenty-four hours after the operation. The patient was most difficult to control. He complained greatly of pain. His nervousness was controlled with bromides. About two and a half weeks after the operation a psychosis due to the bromides developed. When the medication was discontinued the patient's mind became normal. He complained bitterly of the suprapubic drainage, but this had to be left in because the perineal wound was very slow in healing. All instrumentations of the urethra, such as the passing of sounds, had to be done after the patient was given gas and oxygen. A month after the operation it was felt that the perineal wound was sufficiently healed and the urethra normal enough to permit the patient to void. The suprapubic tube was removed, a No 16 soft rubber catheter was inserted through the urethra into the bladder and Connell suction was applied. Again the patient could not stand the pain of a urethral catheter, and it had to be removed the second day after insertion. The urine then drained through the suprapubic wound, and very small amounts were voided.

In the early part of August it was noticed that the glands in both inguinal regions were enlarged and indurated and that the skin over them was reddened. Compresses were applied. After several days of compresses, fluctuation was noted in the enlarged inguinal nodes on the left side, and, with 1 per cent procaine hydrochloride anesthesia, the abscess was opened and about 8 cc of pus removed.

About this time also the perineal wound broke down and the urine, instead of passing through the urethra leaked out through the perineum. On Aug 15, 1934, the patient was again operated on, after having been given 500 cc of whole blood. While he was under gas and oxygen anesthesia the perineal wound was opened. Greatly to our surprise we found that along the infected margins of the urethra rounded tissue had formed which at first looked like granulation tissue except that it was paler and did not bleed easily. Examination showed that this granular tissue had formed a line of cleavage between the layers of skin and muscle in the left inguinal

region, so that the examining finger could feel this nobby, irregular growth as far as the inguinal glands on the left side.

It was recognized immediately that the condition was not a simple one but some type of malignant process. The urethra was followed down by elevating the transversus perinei muscles, and the whole area between the urethra and the rectum was found to be involved by the granular tissue. The rectourethralis muscle could not be identified because the whole space between the urethra and the rectum was filled. The material was dissected as far as the prostate. The rectum was depressed and the urethra was retracted upward. This peculiar tissue could be felt as far as the prostate and extended on both sides. Because of the attachment and the position, it was impossible to remove all of it.

A fenestrated rubber tube was inserted down through the inguinal region and out through the perineal wound. A No 26 soft rubber catheter was inserted through the suprapubic fistula into the bladder and held in place by a silkworm gut suture. The wounds were left wide open, and a piece of the new growth was removed for microscopic examination.

Pathologic Examination—Sections showed a new growth composed of large masses of invading epithelium. In some regions the stroma was extremely scanty. In other regions the growth extended in fine strands into the fatty tissue, individual cords being separated by a varied though usually scanty amount of fibrous tissue. The cells of the growth were of medium size, with relatively large, clear-staining nuclei and a large amount of cytoplasm in the regions showing hyaline alteration. The cytoplasm was relatively scanty in the actively invaded portion. Cells in mitotic division were not infrequent.

The diagnosis was squamous cell carcinoma.

Further Course—The patient was given eleven high voltage roentgen treatments over the bladder, perineum and inguinal regions. Although he was not told he had a malignant growth, the fact that he had these treatments made him very suspicious, and, being of a nervous neurotic type, he did not cooperate. Roentgenograms of the lungs at the time the roentgen treatments were given showed no metastasis. However, the patient became very morose, refused to eat, gradually became weaker and septic, and died on September 19.

SUMMARY AND CONCLUSIONS

Primary carcinoma of the male urethra is a rare disease, only 143 cases having been reported previously.

Reports of two new cases bring the total to 145.

For clinical purposes carcinoma of the male urethra is divided into two main groups, depending on the location of the growth.

The treatment of carcinoma involving the anterior portion of the urethra which has given the greatest number of cures is partial or complete amputation of the penis.

The best results obtained when the malignant process involved the posterior portion was resection of the urethra with the included growth.

Inguinal adenectomy is advisable in all cases.

Sufficient data have not been obtained up to the present time for one to evaluate roentgen and radium treatment without previous surgical intervention.

2000 Van Ness Avenue

An Individual Kind of Superstructure—You who are graduating here today wherever you land—in laboratory, in hospital clinic, in practice—will have occasion to lament the insufficiencies of your preparation. This has been so from the beginning and will be so to the end of time. However secure the foundation may appear to have been laid, you will come to build on it an individual kind of superstructure which could not possibly have been anticipated.—Cushing, Harvey. *Consecratio Medici and Other Papers* Boston Little Brown & Co 1928

THE MANAGEMENT OF TUMOR OF THE TESTICLE

FRANK HINMAN, M D
SAN FRANCISCO
AND
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LOS ANGELES

Usually the general practitioner of medicine, not the specialist, first sees the patient with a neoplasm of the testicle. Although uncommon, such tumors are not extremely rare. Most of them are very malignant, and it is only by early diagnosis and proper treatment that any patients are cured. New methods of diagnosis and of treatment have made possible earlier recognition and better management, with the result that more patients can be cured than ever before. This recently accumulated knowledge has not become generally known. It is the present purpose to discuss briefly what would seem to be the logical management of the patient in the light of recent knowledge. Two illustrative cases of unusual interest are reported. An analysis of fifty-eight cases of tumor of the testicle, in all of which hormonal tests were made, forms the basis for the following outline of the seven steps of management. The majority of the fifty-eight patients have been observed for three years or longer.

1 *The Clinical History*—The age of the patient, the character of the onset and the duration and course of

irradiation, with the idea of preventing metastases, is not only unnecessary but has many disadvantages.

3 *The Diagnostic Hormonal Test*—The freshly voided morning urine is tested for gonadotropic hormone, and the finding of at least 300 mouse units per liter (M U L) is strong evidence that the mass in the testicle is an embryonal tumor. If, however, the test shows less than this amount or is entirely negative, the possibility that the tumor may be malignant is not ruled out. About one fifth of the total number of our patients who subsequently were proved to have a malignant growth did not excrete the gonadotropic substance. When the hormonal test is positive, immediate orchidectomy is indicated for reasons given hereafter. When the test is negative but the clinical and physical evidence strongly points to tumor, orchidectomy is indicated as strongly. The older method of exploration and biopsy at the time of operation should be discarded.

4 *Early Orchidectomy*—Orchidectomy should be radical, not exploratory, and the handling and squeezing of the scrotal mass should be avoided. The cord is exposed through a high inguinal incision as for herniotomy. It is then clamped and divided, all the lymphatic and vascular channels leading from the neoplasm being thereby severed. With traction on the cord the scrotal mass is freed by blunt dissection and delivered through the inguinal incision.

The advantages of early orchidectomy by this method are as follows:

(a) If metastases have not already occurred the operation will cure the patient, and even if they have it will prevent the further spread of malignant cells from the primary tumor.

(b) It furnishes the laboratory with the fresh tissue of the primary tumor unmodified by x-ray or other treatment. (1) Extraction of this material gives the most dependable information concerning the gonadotropic hormone and the most reliable check of the result of the previous tests of the urine. (2) Histologic study of the fresh tissue of the unaltered tumor (preferably fixed in Zenker's solution), in correlation with the results of the hormonal tests, permits a satisfactory classification of the neoplasm.

(c) With a classification based on a correlation of hormonal tests and the histologic study of the fresh tumor, one is better able to determine the prognosis and to outline the extent of further treatment, whether it is surgical, roentgenologic or both.

(d) The fact that irradiation of the scrotum has become unnecessary makes it possible for the roentgenologist to treat the patient with massive doses of x-ray with less danger of sterilizing him by accidental irradiation of the good testicle. This danger persists nevertheless, and the remaining testicle should be carefully screened during all roentgenologic treatment. Because of carelessness in this regard one of our patients, well otherwise, is sterile.

5 *The Correlation of Hormonal Tests with the Histologic Picture*—A histologic study in over 100 cases of testicular tumor, in fifty-eight of which hormonal tests were made, shows that a correlation of these two studies helps greatly in the classification of tumors in relation to their radiocurability.

Histologically, in correlation with the hormonal test, three main groups of tumors are recognized: (1) embryonal tumors with hormonal excretion, (2) embryonal tumors without hormonal excretion and (3) miscellaneous tumors, which are rare and cannot be classified.

TABLE 1—Histologic-Hormonal Classification of Embryonal Tumors

1	Teratoma
a	Chorionepithelioma (primitive)
b	Adenocarcinoma etc.
(1)	Primitive
(2)	Differentiated
c	Differentiated
(1)	With hormonal excretion
(2)	Without hormonal excretion
2	Carcinoma
a	Primitive
(1)	With lymphoid stroma
(2)	Without lymphoid stroma
b	Differentiated
(1)	With hormonal excretion
(2)	Without hormonal excretion

the swelling are important points in diagnosis and prognosis. Men should be made as intelligent about tumors of the testis as women have been made about tumors of the breast. A patient who comes for advice as soon as the tumor is noticed has a better prognosis than the one who delays. In the past there has been entirely too much procrastination in seeking medical counsel, six months is the average period elapsing between the time the patient is first conscious of trouble and the time that he sees his doctor.

2 *The Physical Examination*—There is a mass in the scrotum which gives the sensation of weight and does not transmit light. The other physical conditions may vary. These variable differentiating points will not be discussed, since they may be found in textbooks. It should be emphasized, however, that the practice by the physician of repeatedly palpating, examining and squeezing such masses is to be highly condemned. The danger of squeezing the cells of a malignant tumor into the lymphatics or blood stream is far greater at examination than at orchidectomy when that procedure is properly planned and carried out. Preliminary

Read before the Section on Urology at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1937.

into either of the other two groups. Only embryonal tumors cause the excretion in the urine of the gonadotropic hormone. The more embryonal and primitive the tumors are the more active will they be in the formation of the hormone. As they become differentiated and adult in type, less and less of the hormone is formed until so little may be excreted as to fail of detection by animal test. In this connection it should be noted that the amount of hormone which is formed is proportional to the total mass of the tumor which is present. A small amount of tumor tissue will form less hormone than a large tumor of the same type. The histologic and hormonal evidence, therefore, must be correlated in connection with the clinical picture. In this correlation a series of hormonal tests is useful. By a series is meant (a) the hormonal test of the urine before orchidectomy, (b) the hormonal test of an extract of the fresh tissue obtained by orchidectomy and (c) periodic hormonal tests of the urine after orchidectomy and during or following irradiation. The disappearance of the hormone from the urine after either operation or roentgenotherapy is not nearly so

a primitive type of cell and other varieties with a more adult and fully differentiated type, some of the latter do not cause the excretion of the gonadotropic hormone in the urine. The same condition is found among the embryonal mixed-cell tumors, or teratomas. The most primitive of these is the chorionepithelioma, which has the highest hormonal output of any tumor, whereas, the most fully differentiated tumor of this group, the fully differentiated teratoma, causes little or no excretion of hormone.

The histologic-hormonal classification of the embryonal tumors, fully differentiated forms of which are without hormonal excretion, is shown in table 1.

The value of the hormonal test in correlation with the histologic picture is twofold: first, in prognosis and second, in treatment. Correlation gives greater ability in predicting the outcome and in determining more definitely the presence or absence of metastases, which together form the most reliable guide to subsequent surgical intervention or irradiation.

6 Prognosis—As a whole, embryonal tumors of the teratoid group (table 2) are radioresistant and very

TABLE 2—Analysis of Fifty-Eight Cases of Testicular Tumor in Which Hormonal Tests Were Performed

Histologic Classification	Number of Cases	Hormonal Excretion M U L* (Average)	Response to Irradiation	Prognosis	Result	
					Dead	Alive
A Embryonal tumors (hormone present)						
I Teratoid (mixed cell)						
a Chorionepithelioma	2	20 000 to 3 000 000	Fair	Poor	2	0
b Adenocarcinoma	6	2 000 to 1 000 000	Fair	Poor	6	0
c Differentiated (with carcinomatous elements)	6	1 000 to 200,000	Fair	Poor	5	1†
II Carcinoma (monocellular)						
a Primitive						
(1) Without lymphoid stroma	7	1 000 to 1 000 000	Good	Poor	0	2‡
(2) With lymphoid stroma						
b Differentiated						
(1) With hormonal excretion	26	1 000 or less	Good	Good	4§	22
(2) Without hormonal excretion						
B Adult tumors (hormone absent)						
Adult teratoma	7	None	Poor	Good	0	5
Adult carcinoma	8	None	Good	Fair	1#	7
C Miscellaneous tumors	0	None				

* Mouse units per liter of urine.

† Patient living 5 years afterward. Irradiation excellent. Abdominal metastases have disappeared. Hormone now 2.0 M U L.

‡ Patient 1 living two years afterward. Irradiation fair. Well no metastases. Patient 2 living two years afterward. Irradiation fair. Well no metastases. Hormone 100 M U L.

§ Patient 1 lived three years. Irradiation fair. Died with extensive abdominal metastases. Hormone always below 500 M U L. Patient 2 lived six years. Irradiation excellent. Died of widespread metastases. Hormone always below 3.0 M U L. Patient 3 lived one and a half months. Irradiation fair. Died of metastases. Hormone absent. Patient 4 lived three years. Irradiation fair. Died of metastases. Hormone very low.

Patient lived three years. Irradiation fair. Died of extensive metastases. Hormone always absent.

significant as its persistence. Persistence at a pathologic level (400 M U L or higher) indicates unquestionably that residual neoplastic tissue is present, while the disappearance of the hormone does not always mean the absence of malignant cells.

The practice in certain clinics of giving massive doses of x-rays to the primary tumor in the testicle before surgical removal largely destroys the information which can be obtained by the foregoing series of tests. Some cures by irradiation have been reported without orchidectomy—but also without histologic confirmation of the diagnosis. Irradiation before operation is likely to make it impossible to get good histologic sections for microscopic study after orchidectomy. In the interpretation of hormonal tests it should be remembered that irradiation either by actual destruction of cells or by inhibition of their ability to secrete may cause a considerable reduction in the amount of hormone excreted.

Histologically, the embryonal tumors are subdivided into monocellular and mixed-cell tumors, the old subgroups recognized by Cheyassu as seminoma and teratoma. Among the monocellular tumors, more universally called embryonal carcinomas, are varieties with

malignant and afford a poor prognosis. The true adult teratoma (not embryonal) is clinically benign, although potentially malignant, and early surgical removal will effect a cure. The primitive types of the carcinomatous group of embryonal tumors (monocellular) are very malignant and although highly radiosensitive as a rule, indicate a poor prognosis. Fortunately about 50 per cent of testicular tumors belong to the differentiated type of the carcinomatous group of embryonal tumors. This group affords the best prognosis. The hormonal excretion is low, and the patients, as a whole, respond well to irradiation (table 2).

7 Subsequent Treatment—The six steps which have been given in the management of tumor of the testicle cover the treatment of this condition up to the point of subsequent treatment since they have in mind throughout the cure of the patient. Early diagnosis and prompt orchidectomy offer the surest cure. The procedures to be followed afterward depend on the results. In the absence of demonstrable metastases and of the gonadotropic hormone previously present, further treatment at the time is not indicated. The patient is advised to return periodically (every three months) for physical examination and a hormonal test.

of the urine. With the appearance of metastases clinically or the recurrence of the hormone in the urine, treatment should follow the indications given by the histologic classification of the tumor correlated with the series of hormonal tests up to this time.

When metastases can be observed clinically, radical surgical treatment of any kind is useless and intensive irradiation alone is indicated. When metastases cannot be demonstrated clinically and the hormonal test remains positive or becomes so after orchidectomy, the most probable location of the metastases is in the primary and secondary lymph zones of the testicle. If the tumor is radiosensitive, as shown by its histologic-hormonal classification, this area should be intensively irradiated. If the probable response to irradiation of the metastases presumed to be in the primary lymph zone is estimated by the foregoing classification to be only fair or poor, then after irradiation an attempt radically to remove the lymphatic area should be made. Radical operation was performed on only three of the fifty-eight patients discussed in this report. All are living and well (no metastases clinically, hormonal tests negative), one seven years, one three years and one two years after the operation.

REPORT OF TWO UNUSUAL CASES OF CHORIONEPITHELIOMA

CASE 1—A man, aged 38, received a severe blow from a door knob on his right testicle in August 1933. This caused excruciating pain. Considerable swelling followed the injury, and a hard mass developed in his scrotum and remained for several weeks. Within a month or so after the mass appeared, gynecomastia gradually developed, together with an increase in sexual libido and an increase of hair on his chest. The patient's physician examined him carefully, including his testes, and found no convincing evidence of testicular neoplasm at that time. In October the scrotal mass was removed surgically and found to be malignant. The patient was then referred to our clinic. Considering the fact that the tumor mass had been removed and no metastases could be discerned physically or from roentgenograms, the hormonal tests (10,000 M U L) indicated a high hormonal level. After the use of roentgen therapy the hormonal level dropped, but the hormone never disappeared from the urine. Three months later the excretion of hormone became increasingly elevated, and a metastatic node was palpated in the left supraclavicular area. Again heavily filtered radiation at 850 kilovolts was used. The patient did not tolerate this treatment well, and it was discontinued before the course had been finished. Although he soon felt well again, his hormonal excretion rapidly increased. He died on Nov. 26, 1934. The urine recovered from the bladder at the autopsy, as well as the tissue juices, was found to contain 1,000,000 mouse units of gonadotropic hormone per liter. (We knew of no other instance of as high a urinary titer.)

Chief Points in the Necropsy—The original tumor was of mixed-cell type, with high hormonal urinary output. Some of the areas appeared relatively benign. Sections from tissue removed from the lungs showed chorionic elements. Sections from metastases in the retroperitoneal lymphatics and the liver showed a primitive type of unicellular tumor. There were no metastases below the external iliac vessels. The prostate was not enlarged in spite of the high saturation with gonadotropic substance. The anterior pituitary body was strikingly eosinophilic.

CASE 2—Another of our patients with tumor of the testis had gynecomastia and a high urinary titer (1,000,000 M U L) but at the necropsy no definite chorionic elements were found. The other observations at necropsy were almost identical with those in case 1.

The absence of chorionic elements, with all other features so similar, would seem to indicate that primitive tumors, whether mixed or unicellular, are essen-

tially the same biologically. This relationship is not found in the more adult and differentiated types of the two groups. The differentiated types of the unicellular tumors behave differently from the more differentiated mixed-cell tumors containing embryonal malignant elements (table 2). The fully differentiated monocellular tumor (seminoma) without hormonal excretion apparently affords a poorer prognosis than the more differentiated embryonal carcinoma, which is similar to it histologically but causes hormonal excretion; the adult mixed tumors without hormone are practically benign as compared with the more differentiated adult-like teratomas with hormonal excretion. The latter indicate a poor prognosis.

SUMMARY

Fifty-eight cases of tumor of the testis were analyzed and the tumors grouped according to a histologic-hormonal classification. In two unusual cases of primitive tumor the urinary hormonal titer reached 1,000,000 mouse units per liter. The steps to be followed in the logical management of tumor of the testis are: (1) clinical history, (2) physical examination, (3) hormonal test of the urine, (4) orchidectomy, (5) histologic-hormonal classification of the tumor, (6) prognosis and (7) subsequent treatment.

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RENAL CARCINOMA

A STUDY OF NINETY-FIVE CASES, WITH FOLLOW-UP NOTES ON THIRTY-SIX

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This study embodies a clinical resume of ninety-five cases of renal carcinoma (table 1). Thirty-one (32.6 per cent) of this number were studied at necropsy. In seventeen (17.89 per cent) of these the condition was discovered as a chance observation, ten patients (10.43 per cent) died after irradiation and four (6.31 per cent) postoperatively. Fifty-three (55.78 per cent) had a nephrectomy, four (4.21 per cent) a nephroureterectomy and one (1.05 per cent) a biopsy of a supposedly retroperitoneal mass which was in fact a renal neoplasm with extensive local metastasis. Seventeen (29.82 per cent) are living and with the exception of four (7.01 per cent) are in good health. Thirty-six (63.15 per cent) are dead, this number includes six (10.52 per cent) who died postoperatively. The remaining thirty (31.57 per cent) lived from less than one year to ten years and five months. Four (7.01 per cent) patients were not traceable. Eleven (11.7 per cent) refused treatment, had a carcinoma considered inoperable or left the hospital, no attempt was made to ascertain their present status. In many cases it was necessary to utilize the bureau of vital statistics of several states.

There were sixty-seven (70.52 per cent) males and twenty-eight (29.47 per cent) females (table 2). It is interesting to note that the four children (4.21 per cent) in the series were girls. The right kidney was affected in forty-eight cases (50.52 per cent) and it was left in thirty-nine (41.05 per cent), in six (6.31 per cent) the affected kidney was not stated. In two cases

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Read before the Section on Urology at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, June 10, 1937.

(21 per cent) there was bilateral involvement, the condition was noted at necropsy, a primary carcinoma in one kidney with metastasis to the opposite kidney. The ages ranged from 7 months to 84 years, the greatest number of cases occurring in the decades from 40 to 70.

PATHOLOGY

Needless to say there still exists much confusion as to the origin of renal carcinomas, and consequently there is a lack of agreement on their classification. In Jefferson Hospital, Dr. Baxter L. Crawford has interested himself for many years in the study and classification of malignant renal tumors in adults. Of this group of ninety-five tumors (table 3), ninety were classified as carcinomas and one as probably a hypernephroma. The four children had either a mixed tumor or an embryonal type of carcinoma.

Discussions have appeared in the literature as to the origin of malignant tumors of the kidney in adults since the theory was advanced by Grawitz in 1883 that the tumors arise from adrenal rests in the kidney. It is evident that many authors use the term "hypernephroma" to include all tumors of the kidney of a certain type, without reference to their origin. Crawford¹ suggested that there would be much less confusion if the term were used to refer only to the tumors which are considered to have originated from adrenal tissue. The consensus at the present time of persons who have made careful studies of large groups of these tumors is that the vast majority are true renal carcinomas and not adrenal tissue tumors. In histologic study of the majority, true columnar epithelial cells forming definite acini and papillae may be demonstrated. Crawford further pointed out the comparative infrequency with which adrenal rests are observed in the kidney and the frequency with which adenomas in various stages of development, which may become malignant, are found. In a series of over 3,000 autopsies at Jefferson Hospital one adrenal rest in the kidney and twenty-nine benign tumors of the kidney (adenomas) were observed.

TABLE 1—Outcome in Ninety Five Cases of Renal Neoplasm

	Number	Percentage
Necropsy	31	32.63
Chance observation	17	
Following irradiation	10	
Postoperative deaths	4	
Operation	58	61.04
Nephrectomy	53	
Nephro ureterectomy	4	
Biopsy	1	
Living (operative series)	17	29.82
Dead (operative series)	56	63.15
Untreated (operative series)	4	7.01
Untreated	11	11.57

Waters² mentioned these tumors as "cortical renal tumors", another term, "hypernephroid tumors," was suggested by Lubarsch.³ Braasch⁴ recently suggested that carcinoma of the cortex may be divided into two groups which have distinct clinical characteristics.

¹ Crawford, Baxter L. Tumors of the Kidney. Pennsylvania M. J. 75: 629-630 (June) 1932. The Classification of Tumors of the Kidney with Special Reference to the Malignant Tumors in Adults. Am. J. 14th S. 615 (Sept.) 1932. personal communication to the author.

² Waters, Charles A. Preoperative Irradiation of Cortical Renal Tumors. Am. J. Roentgenol. 33: 149 (Feb.) 1935.

³ Lubarsch, O. Die destruirenden Nierengewächse in Henke F. and Lubarsch O. Handbuch der Speziellen Pathologischen Anatomie und Histologie. Berlin Julius Springer. Vol. 6, part 1, p. 630.

⁴ Braasch, William F. and Griffin, Miles. Prognosis in Renal Carcinoma. J. A. M. A. 106: 1343-1346 (April 18) 1936.

namely, adenocarcinoma (hypernephroma) and alveolar carcinoma. There is no doubt that the general tendency today, particularly among genito-urinary surgeons, is to study the more practical considerations of diagnosis and management rather than to indulge in continued and oftentimes acrimonious discussion of the classification and terminology.

It is often noted, and correctly so, that the proper evaluation of histologic study of renal carcinoma does and should influence the prognosis. However, unless

TABLE 2—Age and Sex of Patients Location of Neoplasm

	Number	Percentage
Sex		
Males	67	70.52
Females (including 4 children)	28	29.47
Affected kidney		
Right kidney	48	84.21
Left kidney	39	68.42
Unknown	6	10.52
Bilateral (necropsy)	2	3.50
Age		
0-10 years	4	4.21
Age years		
0-10	4	4.21
11-20	2	2.10
21-30	2	2.10
31-40	2	2.10
41-50	27	28.42
51-60	27	28.42
61-70	22	23.15
71-80	5	5.26
80 plus	1	1.05

one has had a large experience in the study of renal tumors, this evaluation becomes increasingly difficult. Crawford stated that there are three main types of carcinoma of the kidney in addition to adrenal cell tumors: true adenocarcinoma, in which definite acini lined by columnar epithelial cells and resembling tubules may be found, the papillary type of carcinoma, composed of a somewhat flattened transitional type of epithelium which usually arises from the pelvis of the kidney or a calyx, extending into the kidney structure, and the more or less solid type, composed of large undifferentiated clear cells arranged to form alveoli, with a small amount of fibrous tissue framework. The last type is the one which most closely resembles hypernephroma and is usually so classified, but the type of cell is entirely different from that found in adrenal tumors, and in many of these true tubule formation and columnar cells may be demonstrated.

SYMPTOMATOLOGY

The triad of symptoms hematuria, mass and pain was present in eighty-two (86.31 per cent), thirty-seven (38.94 per cent) and fifty-two (54.73 per cent) cases, respectively. A typical pyelographic filling defect was noted in forty-nine cases (51.57 per cent). Pyelography was not practiced on patients who were obviously very ill or toxic or in the late stages of the disease. Anemia, loss of weight and weakness were variable. When the latter triad is present and dominates the clinical picture, it is well to suspect a renal malignant growth. In my study it was interesting to note the relative frequency of the variability of the clinical features of each case in contrast to the usual textbook description. Toxicemia was observed in many cases, due to variable causes, intercurrent illness, metastasis or uremia. Interestingly enough, several patients had no symptoms referable to the urinary tract other than the presence of a mass in the abdomen.

In several cases nausea, vomiting and gaseous distention were the only symptoms, and the patient was

in the hospital primarily for study of the gallbladder. One patient had a cough with hemoptysis, and later, when he was admitted to a tuberculosis sanatorium, a mass was found in the abdomen. He was operated on and an adenocarcinoma of the right kidney removed, from which there was metastasis to the lung. He died postoperatively. Chills followed by fever were noted in seven cases. Fever was variable in a great many of the other cases and was probably due to necrosis or hemorrhage in the renal carcinoma. In evaluating

fourteen and twenty-eight months. In the presence of an abdominal mass and hematuria, the chances of the patient's receiving special attention early are proportionally greater. If toxemia, loss of weight and weakness, in conjunction with hematuria or a demonstrable abdominal mass, predominate, the physician may recommend immediate hospitalization. The urologist is then confronted with the end result and may have an opportunity to observe an interesting necropsy.

TABLE 3—Pathology

Entire Series, 93 Cases		
	Number	Percentage
Adenocarcinoma	76	80.00
Papillary carcinoma	5	5.26
Papillary adenocarcinoma	4	4.21
Cyst adenopapillary carcinoma	2	2.10
Squamous cell papillary carcinoma	3	3.15
Hypernephroma	1	1.05
Embryonal carcinoma	4	4.21
Operative Series, 57 Cases		
Adenocarcinoma	39	68.42
Papillary carcinoma	5	8.77
Papillary adenocarcinoma	4	7.01
Cyst adenopapillary carcinoma	2	3.50
Squamous cell papillary carcinoma	2	3.50
Hypernephroma	1	1.75
Embryonal carcinoma	4	7.01

symptoms it is important not to overlook other systems for the cause of variable symptoms. In a few cases other lesions were found in the genito-urinary tract, gallbladder and gastro-intestinal tract.

DURATION OF SYMPTOMS

The duration of symptoms before aid was sought is indeed variable. It is difficult to average the approximate time from the onset of the first symptom to the time of treatment. In one case hematuria was noted in August 1925, and a diagnosis of renal tumor was made. Nephrectomy was advised and refused. After a second attack of hematuria, in November 1927, nephrectomy was done. The diagnosis was adenocarcinoma of the kidney with no metastasis, and radiation therapy was employed. Metastasis to the lumbar vertebrae developed in 1933, and the patient died in November 1936. Clinical investigation of this type is valuable because of the accuracy of the known facts. The average duration of time of symptoms apparently is from less than one year to three years, needless to say there are cases in which it goes beyond this period. In one case with which I am familiar, hematuria was present for seven years before operation, in another case also known to me a mass in the abdomen was present four years previous to nephrectomy. Optimism in the prognosis in the majority of cases of renal neoplasm is possible if one considers the element of time elapsing after the appearance of the first symptom, establishes the diagnosis early and institutes the proper therapeutic measures immediately.

One is impressed with the fact that there is still a great deal of procrastination on the part of the physician in recommending a thorough urologic investigation to the patient when hematuria occurs for the first time. It is evident that the sequence is not particularly different when one reviews the records from 1921 to 1930 and those from 1931 to 1937 in regard to the duration of time between the onset of hematuria and the diagnosis and treatment. I have attempted to average this time and find that it is anywhere between

DIAGNOSIS

The diagnosis of renal neoplasm resolves itself into three distinct phases. A complete clinical history is absolutely essential, particularly if hematuria is a prominent symptom. One must emphasize the need for a complete physical examination. It may seem superfluous that it is still necessary to stress these fundamental requirements. It is not the purpose of this discussion to outline the method of procedure that should be followed to obtain this necessary information, every physician is or should be familiar with it. One is not surprised that the patient becomes a "neurotic" and looks for relief to agencies outside the realm of medicine because the physician fails to carry out the most basic fundamentals of his training. The third phase of the diagnosis, a complete urologic examination, includes methods with which urologists are all familiar, namely, cystoscopy, retrograde pyelography, intravenous urography and renal function studies and urine, blood and dye elimination tests. Despite the fact that with the advent of pyelography it was assumed that there would be no more preoperative errors, one still sees occasionally that more minute attention on the part of the roentgenologist and the urologist must be given to this procedure.

Numerous authors report on the use of intravenous urography for diagnosis of renal tumors. I believe that one should be careful in placing too much faith in the interpretation of intravenous urograms in the case of renal tumor. One must recognize the fact that the better results in preoperative diagnosis due to the use of the excretory urogram occur in clinics where there is thorough appreciation of the shortcomings of urography.

TABLE 4—Signs and Symptoms

	Number
Hematuria	81
Pain	22
Mass	4
Typical pyelographic defect	49
Chills and fever	11
Fever	Variable
Gastro-intestinal symptoms	5
Toxemia	Variable
Anemia	Variable
Weakness	Variable

When a precise and minute detail of the kidney pelvis and its calices is needed the retrograde pyelogram is still the best method of approaching a more correct diagnosis of renal tumor.

The method of procedure of retrograde pyelography in Jefferson Hospital has not varied since 1912 when the late Prof. Willis F. Manges first described the advantages of injection of opaque solution into the renal pelvis under fluoroscopic control. Dr. Manges, in his paper on the subject, said "Pyeloscopy is a

preliminary to pyelography and adds, we believe, distinctly to the comfort of the patient as well as to the safety and accuracy of the entire procedure." This statement is just as applicable today as it was when it was written. The highest degree of efficiency of a retrograde pyelography can be attained by practicing pyeloscopy.

A word as to the technique that may be followed in obtaining excellent retrograde pyelograms may be worth while. Careful preparation of the patient and a preliminary roentgenogram are important requirements. The roentgenogram should be of such quality as to show the outline of the kidney under investigation if it is anywhere near normal as to size, shape and position. Previous knowledge of variations in these respects helps one in injecting the opaque solution to produce the best possible pyelograms.

In all the cases in which a retrograde pyelogram was made, injections were done under fluoroscopic visualization. This method is of particular advantage in the diagnosis of tumor of the kidney and in the differentiation of renal and extrarenal masses, since one can see the effect of palpation. If a mass is palpable, one determines with certainty whether it is part of the kidney or independent of it. Palpation is done either before the pelvis and calices are completely filled or after the pyelographic films are exposed.

One must be certain that the opaque solution has free access to the pelvis and calices and then observe the action of the pelvis and calices during the filling process. If there is a suggestion of deformity, one should determine whether the solution will run by the catheter into the bladder, if it does there is little risk of overdistention of the pelvis with moderate pressure over the course of the ureter. The study may then be deliberate and several films be exposed. If there is no reflux the injection must be made very slowly and carefully, so as not to produce pain and spasm of the pelvis and calices. I have repeatedly seen rapidly emptying pelvis, and on several occasions I have seen the calices empty while the pelvis remained filled, in one instance one calix, the upper, filled and emptied repeatedly during the injection, independently of the other calices and the pelvis. Pyelograms are made rapidly by placing a cassette on the abdomen of the patient and exposing through a small diaphragm opening, with the tube under the table. Such exposures are made in a fraction of a second and at any moment during the injection when conditions are favorable. My associates and I then make pyelograms of the entire urinary tract with the aid of the Potter-Bucky diaphragm.

The interpretation of pyelograms requires the combined skill of the roentgenologist and the urologist. As all urologists know, the diagnosis of renal tumor depends on some degree of deformity in the pelvis or the calices as revealed by the injected opaque solution. There are several types of deformities. First, and perhaps most characteristic, is the elongation of one or more calices, a condition which must be differentiated carefully from reduplication of the pelvis especially when it involves the upper pole. The next most common deformity is the complete obliteration of one or more calices, with the defect having, as a rule, a smooth outline at the base of the calix or at the adjacent pelvis. Cystic tumors are apt to produce such a deformity. It may involve more than one portion of the pelvis and calix outline. Frequently there are small, crescent-shaped borders of the shadow of the

opaque fluid. These are only diagnostic when they are constant in a series of exposures. Another type of deformity, the third, is dilatation of a calix due to pressure obstruction at a proximal point. One calix may dilate to a large extent and perhaps all the rest of the pelvis and the calices, so that all of the natural shape of the pelvis is distorted and the opaque solution seems to take on a wavy appearance throughout a considerable area.

The difficulty in interpretation comes mostly no doubt with the first type, elongation of perhaps only a single calix. In addition to the elongation the lumen is narrowed, and the narrowed lumen of a somewhat elongated calix has just the same appearance as a normal calix in a state of contraction. I depend entirely on serial exposures to determine whether the lumen is constant, and of course I also have the benefit of fluoroscopic observation during the injection. When more than one calix is involved, the problem is increasingly less difficult.

In the other three types of deformity the success of the interpretation depends entirely and only on the production of pyelograms that really demonstrate the size and the shape of the lumen of the pelvis and calices. One frequently cannot differentiate a cystic tumor and a solid one unless one can palpate the mass.

The differential diagnosis of extrarenal tumor is based entirely on palpation during the injection under fluoroscopic control. This is true also in the case of a rotated kidney, that is, the kidney may be rotated in such a manner as to give abnormal shape and arrangement to the shadow of the opaque solution. In such instances one can, by viewing the kidney fluoroscopically from a variety of angles, differentiate a normally rotated kidney from an abnormal one.

In investigation of the urinary tract one must constantly bear in mind that a lesion other than neoplasm may be present. Calculus, tuberculosis and cystic disease may be found in the upper part of the urinary tract, prostatism, neoplasm, diverticulum and calculus may be observed in the lower part. In the case of extrarenal lesions one must keep in mind the gallbladder, the gastro-intestinal tract and the retro-peritoneal space. The differential diagnosis of retro-peritoneal masses from renal neoplasms is difficult because of the possibility of extension of the renal tumor in the surrounding tissues. There is a case of retroperitoneal mass in my series in which an exploratory operation was performed and material for biopsy taken from the mass, which proved to be adenocarcinoma, at necropsy the primary growth was observed in the kidney. It is well to mention that a thorough search for metastasis must be undertaken, the lungs are the most frequent site for metastasis and the osseous system a less frequent site.

Relative to the routine use of intravenous urography in the diagnosis of abdominal conditions, it is well to bear in mind that negative evidence in the excretory urograms does not necessarily mean that the kidneys are not the seat of any lesion. A case in my necropsy series illustrates this fact very strikingly. The urinary tract was ruled out by intravenous urography. The complaints of the patient were referred to the gastro-intestinal tract, and there were general weakness and toxemia. The autopsy disclosed an adenocarcinoma of the right kidney. There were no metastases. Gastro-intestinal symptoms without accompanying urinary symptoms but with generalized weakness, loss of weight and negative results of x-ray examination

of the gastro-intestinal tract should impress the attending physician with the necessity of investigation of the urinary tract. Certain patients apparently are in good health but have vague gastric symptoms or discomfort in the right upper abdominal quadrant. They are usually studied from the point of view of the general surgeon or the gastro-enterologist. Two patients in my series who were under observation five years and two years, respectively, illustrate this point. Repeated cholecystograms and gastro-intestinal studies

TABLE 5—Operative Approach

	Number	Percentage
Lumbar (supplemented by resection of the twelfth rib in 16 cases)	36	63.15
Transperitoneal	18	31.57
Combined lumbar and transperitoneal	3	5.26
Irradiation		
Preoperative and postoperative irradiation	7	12.28
Postoperative irradiation	31	54.38
Irradiation alone	14	24.73

revealed nothing of note. It was not until the urinary tract was investigated that the correct diagnosis of renal neoplasm was made.

TREATMENT

The management of renal neoplasm has today resolved itself into three major groupings: first, preoperative and postoperative irradiation with surgical intervention; second, operation with subsequent irradiation; and, third, irradiation alone, used only when operation is contraindicated.

Waters'2 recent paper on preoperative irradiation of cortical renal tumors is undoubtedly a valuable contribution to the modern management of the great majority of renal neoplasms. He noted a striking reduction in size of radiosensitive renal tumors following irradiation and has rendered operable tumors which were inoperable because of their large size. One must decide the type of tumor which is radiosensitive or radioresistant. Waters has shown that the radiosensitive type is the adenocarcinoma, or the so-called hypernephroma. Papillary carcinomas of the renal pelvis and malignant papillary cystadenomas are radio-resistant. Such tumors are apt to metastasize by way of the ureter into the bladder, and therefore, if surgical procedure is decided on, a nephro-ureterectomy should be performed rather than a nephrectomy.

In my series seven patients (12.28 per cent) received both preoperative and postoperative irradiation, in two cases the preoperative irradiation was employed because of the size of the tumor, and after reduction in size of the tumor nephrectomy was performed. In thirty-one cases (54.38 per cent) postoperative irradiation was used.

In exposure of the kidney the surgeon has the choice of the lumbar route (the retroperitoneal) or the abdominal route (the transperitoneal) or a combination of the two. In thirty-six (63.15 per cent) of my cases the lumbar incision was employed, in eighteen (31.57 per cent) recourse was had to the transperitoneal route. The fact that the majority of surgeons prefer the transperitoneal approach in surgical treatment of tumor of the kidney does not necessarily mean that it is the only avenue of choice. The main reasons for the transperitoneal approach were invariably the size of the tumor and the comparative ease with which the pedicle could be efficiently controlled. Since preoperative irradiation will reduce the size of many renal

neoplasms, the balance may be swung toward the lumbar route. Recourse to the combined method was necessitated in three of the cases in this series, in 2 of the pedicle was large, short, adherent and so involved by adhesions that a transperitoneal approach supplemented the lumbar route. My feeling is that the lumbar route is the better, but when the operator is clinically assured that the pedicle presents technical difficulties of attack that will enhance the danger of hemorrhage the transperitoneal route becomes the avenue of choice. Difficulty in nephrectomy by the lumbar route presents itself when the tumor is so large that the surgeon cannot place the pedicle clamps efficiently. In sixteen cases the lumbar incision was supplemented by resection of the twelfth rib. Many surgeons advise this procedure in nephrectomy not only for neoplasms but for other renal lesions in which the kidney is adherent to the dome of the diaphragm, the liver and the retroperitoneum.

The dangers of biopsy in the case of renal neoplasm should be thoroughly appreciated, if there is any avenue for metastasis this certainly is one. I have had no personal experience with aspiration biopsy of renal neoplasms, but it seems to me that sound surgical philosophy is against this unsurgical procedure.

PROGNOSIS

The variable factors in the prognosis of renal neoplasm are notable in that there is a general lack of agreement among numerous writers. In reviewing this series of cases it becomes evident to me that several patients were subjected to nephrectomy for whom the prognosis was definitely poor. One patient already had metastasis to the lungs. The tumor was removed, and it was hoped to control the metastasis by irradiation to the lungs; the patient did not survive the operation. In this type of case the advisability of operation is questionable. Three additional postoperative deaths were noted in patients who gave a relatively short clinical history and had a large fixed tumor removed at operation. Apparently there were no local metastases, nevertheless, marked toxemia developed and death followed. Operation in this type of case seems inadvisable, and irradiation should possibly be recommended. The factors that must be taken into consideration to establish a favorable prognosis are first, complete familiarity with the clinical history and physical status of the patient; second, the presence or absence of demonstrable metastases; third, the advisability of instituting preoperative irradiation; fourth, the chances of the patient to survive the ordeal of the operation; fifth, the type of neoplasm that is found and its

TABLE 6—Duration of Life After Operation (Nephrectomy Thirty-Four and Nephro-Ureterectomy Two)

Duration Years	Number	Percentage	Age at Death Years
Less than 1	8	14.0*	40 43 47 50 57 58 61 66
1-2	8	14.03	36 43 49 54 55 60 63 67
2-3	5	8.77	21 41 47 59 64
3-4	4	7.01	28 40 53 62
4-5	3	5.26	56 60 61
5-6	3	5.26	57 60 66
6-7	2	3.50	56 70
7-8	1	1.75	59
8-9	1	1.75	64
10 plus	1	1.75	63
Survived			Under Five Years Percentage 49.12 Over Five Years Percentage 14.6

visable, and irradiation should possibly be recommended. The factors that must be taken into consideration to establish a favorable prognosis are first, complete familiarity with the clinical history and physical status of the patient; second, the presence or absence of demonstrable metastases; third, the advisability of instituting preoperative irradiation; fourth, the chances of the patient to survive the ordeal of the operation; fifth, the type of neoplasm that is found and its

presence or absence of metastasis into or surrounding the pedicle or even the extracapsular and retroperitoneal tissues, sixth, the advisability of instituting postoperative irradiation, not only to the renal area but also to the lungs, as a prophylactic measure, seventh, the institution of general measures to fortify the patient against toxemia and anemia, and eighth, the constant observation of the patient because of the possibility of impending metastasis.

In the presence of metastasis operation should not be recommended unless the patient is in excellent physical condition and the surgeon is prepared to offer him the benefits of a complete radiologic service, it is a fact that the results of surgical intervention in this type of case are abominably poor.

It is wise to take into consideration the report of the pathologist before indicating a favorable prognosis. The histologic evidence of the grade of malignancy influences the prognosis. Involvement of the renal vein does not necessarily indicate an unfavorable prognosis. In one of my cases there was a large tumor

COMMENT

The follow-up studies in this series of cases were undertaken seven years ago. The results may seem disappointing. The crying need for more thorough observation on the part of the physician is evident. If every effort was made to eliminate the possibility of renal tumor in cases of hematuria, the outlook following their surgical removal would be more favorable.

The variations in the clinical picture and, in conjunction, the histologic examination of the neoplasm, with or without metastasis, are the practical problems that must be considered in attempting to establish a favorable prognosis.

Waters⁶ and Wharton⁶ have reported interesting results of preoperative irradiation. The number in our series who received preoperative irradiation is small, seven (12.28 per cent). The duration of life following this treatment is not sufficient to warrant any comment at the present time. The majority of patients in my series received irradiation postoperatively. At present one cannot tell what the final outcome will be in com-

TABLE 7—Data on Fifteen Patients Who Had Nephrectomies and on Two Who had Nephro-Ureterectomies

Name	Age	Sex	Date	Pathology	Metastasis	Roentgen Treatment	Living After	
							Years	Months
G McB	51	♂	2/ 8/24	Left adenocarcinoma		Postoperative	13	3
			12/11/29	Carcinoma left epididymis	Yes			
L S	42	♂	11/ 3/27	Right adenocarcinoma	None	Postoperative	9	6
G M	53	♂	11/14/28	Right adenocarcinoma	None	Postoperative	8	6
H C	53	♂	5/20/30	Right carcinoma	None	Postoperative	7	
E B	49	♂	5/31/30	Right adenocarcinoma	None	Postoperative	7	
J K	47	♂	7/11/30	Right adenocarcinoma	None	Postoperative	6	10
A W	57	♂	11/28/30	Right adenocarcinoma	None	Postoperative	6	6
E H	7 months	♂	9/ 9/32	Left embryonal carcinoma	None	Preoperative and postoperative	4	8
B F	47	♂	4/11/34	Right adenocarcinoma	None	Preoperative and postoperative	3	1
H P	49	♂	5/31/34	Right adenocarcinoma	None	Postoperative	3	
C M	49	♂	7/ 3/34	Right adenocarcinoma	None	Postoperative	2	10
J L	54	♂	9/ 0/34	Right adenocarcinoma involving renal vein and capsule	None	Preoperative and postoperative	2	8
J I	54	♂	1/31/35	Left adenocarcinoma	Yes	Postoperative	2	4
A S	43	♂	5/ 4/36	Right adenocarcinoma	None	Preoperative and postoperative	1	
H B	46	♂	7/22/36	Right adenocarcinoma	Yes	Preoperative and postoperative	0	10
M M	6	♀	0/14/36	Embryonal carcinoma Wilms tumor	None	Preoperative and postoperative	0	8
I S	46	♂	12/11/ 6	Left papillary adenocarcinoma	None	Postoperative	0	5

Seventeen living (29.82 per cent) even living after five years (12.28 per cent) six living after from two to five years (10.52 per cent)

thrombosis of the left renal vein at operation but no evidence of distant metastasis could be found. This patient had a recurrence five years later in the left scrotal veins and epididymis, which were removed. He is living and well thirteen years after the removal of the kidney. Several patients have been observed at necropsy with large renal tumors in which the renal vein and vena cava were involved, but with only a few small, distant metastases, which apparently were very recent. On the other hand, there were cases in which no pedicular involvement was noted and the patient died within several years after the operation. Calcification of renal tumors is rather frequent and indicates a favorable prognosis. Local extension into the surrounding tissues also influences the prognosis. However one patient in whom local extension was demonstrated is living and well today two and one-half years after nephrectomy. He received irradiation postoperatively, as have the majority of patients since 1925.

In the operative series the highest percentage of mortality is in the first two years after operation. The contributing factors that influence this high mortality are the development of metastasis and subsequent profound toxemia. Some of the patients may be salvaged in the future by the application of the more modern methods of management, particularly in regard to irradiation, preoperative and postoperative.

parison with that of preoperative irradiation. Whether or not metastasis is prevented or controlled is questionable as the metastasis although undemonstrable, may have been present before the patient was treated.

There should no longer be any question of the advisability of instituting irradiation in the treatment of large renal tumors before surgical intervention is attempted. In so doing one must remember that operative removal is imperative from three to five weeks after the irradiation, as regrowth is likely to occur if operation is delayed too long. One is compelled to doubt the few reports that are available wherein postoperative irradiation is said to have cleared up the metastasis. In several cases in my series, metastasis to the lungs was definitely controlled temporarily, but the patient died from a year and a half to two years after the discovery of the metastasis.

The percentage of patients living over five years is 26.28 (tables 6 and 7). The highest mortality rate occurred within the first two year period (in our series 28 per cent). Metastases, as noted previously, can occur early or late. The majority, however, appear to develop relatively early, possibly within the first two years, and thus death is merely a matter of time.

6 Wharton, Lawrence P. Preoperative Irradiation of Massive Tumors of the Kidney. A Clinical and Pathologic Study. Arch Surg 30: 32-51 (Jan) 1935.

SUMMARY

Of ninety-five patients with renal carcinoma, fifty-eight (61 per cent) were subjected to operation, of which number seventeen (29.82 per cent) are living after from five months to thirteen years and three months, thirty-six (63.15 per cent) are dead, including six (10.52 per cent) who died after operation. The survival period of the remaining thirty (31.57 per cent) was from less than one year to ten years and five months. Four patients (7.01 per cent) were not traceable. Thirty-one (32.63 per cent) of the ninety-five were studied at necropsy. In seventeen (17.89 per cent) of these the condition was a chance observation, ten (10.43 per cent) died after irradiation, as their carcinoma was considered inoperable, and four (6.31 per cent) died after operation. Metastasis was found most frequently in the lungs, liver, adrenals and osseous system and less frequently in the lymph glands, renal vein, inferior vena cava, kidney, spleen, heart and brain.

Eleven patients (11.57 per cent) received no treatment, for various reasons.

Renal neoplasms are considered to be renal carcinomas in that true columnar epithelial cells forming definite acini and papillae may be demonstrated. The term hypernephroma is used only to refer to definite adrenal tissue tumors.

This study should impress all clinicians with the importance of the variability of the symptom complex of renal neoplasm. When the so-called four cardinal signs and symptoms of renal tumor (hematuria, pain, mass and a typical pyelographic defect) are present, the diagnosis is simple. Pyeloscopy is a distinct aid in the differential diagnosis of renal lesions. It is important to emphasize the necessity for more investigation on the variable nature or type of renal neoplasms, so that urologists will be able to recommend sound, logical treatment.

The surgical approach to the kidney should depend on the individual conditions and the surgeon's judgment. With the important adjunct of preoperative irradiation, many renal tumors decrease in size, so the lumbar route may be employed more frequently in the future than it has been in the past. For many years in Jefferson Hospital the lumbar incision was supplemented by resection of the twelfth rib. However, the transperitoneal approach still serves as the avenue of choice in many clinics.

With the use of preoperative irradiation as an adjunct to surgical intervention, I believe a distinct advance has been made in the practical management of renal neoplasm. The results reported in the literature hold forth much promise. Nevertheless, the use of postoperative irradiation must be continued in many cases. I am convinced that routine postoperative irradiation has extended the survival period of many of my patients. In view of this experience I shall continue to recommend it.

The prognosis of renal neoplasm places the urologist in an unenvied position. It has been noted that extension of the carcinoma to the renal vein does not necessarily mean a poor prognosis and, vice versa, that no metastasis found in the renal vein at the time of operation does not indicate a favorable prognosis. It is important to remember in this regard that the histologic characteristics of the tumor and, less frequently, the gross appearance of the neoplasm, together with a complete familiarity with the clinical history and

physical condition of the patient, will often help in building up a favorable or unfavorable hypothesis as to the probable survival period. I have definite evidence from both autopsies and operations that metastases do not necessarily occur early. In many cases even though the tumor in the kidney was very large no evidence of metastases could be demonstrated.

Lastly, let me stress the need for individualization in each case of suspected renal neoplasm, in diagnosis, treatment and future observation.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DR. KREUTZMANN AND COLIUFF, DR. HINMAN AND POWELL AND DR. FETTER

DR. JAMES L. ESTES, Tampa, Fla. Drs. Hinman and Powell have shown the recent advances in the management, diagnosis and prognosis of tumor of the testes and have presented a paper that should be appreciated by urologists and general practitioners alike. The diagnosis, management and prognosis of carcinoma of the bladder took a long jump forward when the Carcinoma Registry of the American Urological Association was formed, and the work of the committee and its contributors has been of inestimable value to urologists in the management of such cases. Those engaged in teaching are stressing more and more the importance of the early diagnosis of cancer and impressing on the minds of students the significance of hematuria. It is my feeling that whenever possible, before lay bodies or doctors, urologists should place great emphasis on the passing of blood from the bladder. It should not be difficult to diagnose tumors of the bladder, provided a complete urologic survey is made. It is not always easy to determine the exact extent of infiltrating tumors, and these are the ones that require accurate precision in selecting the best method of procedure. Paring down by transurethral resection and fulguration with postoperative irradiation certainly seems the method of choice but through the opened bladder and by careful palpation with a finger in the rectum (if necessary) the surgeon can define more clearly the local extent and destroy more of the tumor. Certainly radon seeds can be more accurately placed. The urologist must have the thorough cooperation of a clinical pathologist and roentgen therapist in dealing with tumors of the bladder. It is my opinion that preoperative irradiation has been of much help in dealing with carcinoma of the bladder. In metastasis and preventing recurrence, it has a definite place and is the urologist's chief source of therapy. The development of the supervoltage machine used both before and after operation gives more hope than ever that the patient presenting himself with carcinoma of the bladder can be offered better end results than heretofore. As in carcinoma of the bladder, hematuria and pain constitute the outstanding symptom in renal carcinoma and it is my opinion that the average practicing physician is not aware of the possibilities of kidney tumor as he is of bladder tumor. A thorough study during the time of bleeding will reveal evidence of the source and cause of bleeding much more readily than when the examination has been deferred until bleeding has stopped. Thus, I think, urologists should keep before the minds of those engaged in general practice. When hematuria is present, one should make a thorough study from the meatus to the cortex, as well as a search for metastasis.

DR. RUSSELL S. FERGUSON, New York. We are indebted to Drs. Hinman and Powell for their presentation of the management of the patient with teratoma testis. They have presented an orderly routine for the diagnosis and treatment of these highly malignant tumors. It is gratifying to hear a confirmation of the original observations of the behavior of gonadotropic substance in teratoma testis, namely, that the amount excreted varies in proportion to the embryonal character of the neoplasm and to the mass of tumor, and further to the variation in excretion following irradiation of the tumor is of prognostic importance. All urologists are agreed that failure of the hormone to diminish after irradiation is a

prognostic sign, whereas when the amount of gonadotropic substance excreted diminishes rapidly in response to irradiation the prognosis is favorable. The failure to find a measurable amount of hormone in some of the more adult types of tumors is probably not because of the absence of the hormone but because of the crudeness of our biologic tests, which fail to detect the small amounts that are almost certainly present. Negative results, therefore, in this group of cases with present technique are not significant. Positive results are always significant. I find myself in disagreement with Drs. Hinman and Powell on the point of orchidectomy before irradiation. It is conceded that the scientific information to be obtained by microscopic examination of the unaltered tumor and the assay of fresh tissue for gonadotropic substance is an advantage. However, this advantage carries little weight when it is seen that the clinical results to be obtained at the end of five years are better when irradiation precedes orchidectomy. In a review of the Memorial Hospital series of 292 teratomas of the testis treated between 1917 and 1929 it was found that of fourteen patients with primary operable tumors treated by irradiation before orchidectomy, eleven, or 78.5 per cent, were alive and without evidence of disease at the end of five years, whereas of twenty-eight patients with primary operable tumors subjected to orchidectomy before irradiation only twelve, or 42.8 per cent, were alive and well without evidence of disease at the end of five years. It is granted that this spread in results in favor of irradiation before orchidectomy might not be as great had irradiation of all the patients who underwent orchidectomy been done first without delay. In some instances there was considerable delay between the orchidectomy and the irradiation, and therein lies the danger of advising orchidectomy before irradiation. While Drs. Hinman and Powell would not countenance delay, many surgeons are inclined to put off irradiation after orchidectomy until other symptoms ensue. Then it is often too late. It is possible that with immediate irradiation after orchidectomy there may be no difference in the five year end results as compared with patients irradiated before orchidectomy. Yet for the present I feel that the advantage lies with preoperative irradiation.

DR ALFRED F. HOCKER, New York. Dr. Fetter has made clear the pathologic classification of renal tumors and has stressed the importance of thorough urologic examination whenever hematuria is present. I was impressed by the meticulous examination which he makes and especially by his use of pyeloscopy as well as the usual pyelography in radiologic studies of the kidney. Dr. Fetter states that aspiration biopsy is unsurgical. With this I disagree. I have employed aspiration biopsy in a number of cases and have never found it to cause any ill effects on the tumor. Dr. Stewart of the Memorial Hospital has examined more than 7,000 aspirations and has never noticed any damaging effects from its use. Certainly no one objects to the curettage of a cancerous uterus for the diagnosis of neoplasm of the organ nor does the surgeon consider this procedure unsurgical. Regarding the roentgen therapy of renal neoplasms I agree with the criteria of Dr. Fetter. All bulky adult carcinomas of the kidney receive a prolonged preoperative course of daily fractionated doses of x-rays. I have found that it reduces the size of the tumor and makes the operation easier for the surgeon and less hazardous for the patient. I believe that this regression, however, is not due to the radiosensitivity of the cancer but rather to the secondary circulatory accidents which occur, that is the increase in the number of infarcts in the kidney. Besides reducing the size of the tumor radiation therapy undoubtedly lessens the toxemia and by allaying hemorrhage counteracts the anemia. I feel that all adult renal carcinomas are radioresistant. If any are radiosensitive I believe that they are papillary carcinomas of the renal pelvis. After a full course of roentgen therapy to the bulky carcinomas a nephrectomy is done six weeks after the last treatment depending of course on whether or not distant metastasis is present. Embryonal carcinomas in infants are the only type which I have been able to sterilize by x-rays, and in these I rely on irradiation alone or irradiation plus surgical intervention.

DR LYON G. LEWIS, Baltimore. With the development of transurethral surgery urologists may have acquired a rather unusual reaction toward cancer. Not many apparently have any

established idea of the curability of carcinoma of the prostate or bladder. Yet it is their duty to institute treatment toward that end. Palliation is acceptable only when cure is impossible. Noninfiltrating bladder tumors can be eradicated by transurethral surgery plus radium. But there is no proved substitute for radical operation in the treatment of operable infiltrating tumors of the bladder and prostatic carcinoma. The excellent papers of this symposium serve to clarify our position. Agreeing with Drs. Hinman and Powell, I can see no logic in preoperative irradiation of testicular tumors. They can be easily and completely removed without operative traumatism. On the other hand I am convinced of the advisability of preoperative irradiation of cortical renal and perirenal tumors. I think that the first paper on preoperative irradiation of renal tumors was written by Drs. Waters, Frontz and myself in 1933 (*Radiation Therapy of Renal Cortical Neoplasms with Special Reference to Preoperative Irradiation*, *South W J* 27:290 [April] 1934). One of the most thrilling experiences in my urologic career occurred recently when I reexamined a patient operated on seventeen years ago for carcinoma of the prostate by Dr. Young. The diagnosis was established pathologically. There was no palpable evidence of recurrence and roentgenograms were negative for metastasis. May I express my profound admiration for and devotion to the man who taught many of us the perineal route to the prostate, seminal vesicles and bladder. To illustrate the perineal approach for bladder tumor, Dr. Young has asked me to present his case. A man, aged 42, came to the Brady Urological Institute, complaining of intermittent hematuria of two years' duration. The tentative diagnosis of carcinoma of the prostate was made by rectal examination. Because of the limitation of the tumor within the prostatic capsule, radical removal was considered possible. Instrumentation was impossible owing to obstruction in the prostatic urethra. When the prostate was exposed the induration was less evident, and frozen sections from the posterior lamella were negative for carcinoma. Dr. Young then performed urethrotomy and obtained a specimen from the vesical orifice, using his punch. These sections showed transitional cell tumor. The bladder was opened anteriorly, as in the radical operation for carcinoma of the prostate. Digital examination revealed a tumor involving the vesical orifice and right side of the bladder. Resection of the entire prostate and right side of the bladder was carried out. Closure was similar to that in radical perineal prostatectomy.

DR V. D. LESPINASSE, Chicago. The urologic cancer problem is no different from the cancer problem in relation to any other group of organs or any other group of individuals. Most of the discussion today has been on the technical procedures and treatment. I think there should be some methods or means taken so that these cases will get to us earlier. One of the deficiencies of urologic work is that we do not get these cases early enough. Why don't we get these cases earlier? There are two reasons. First, urologic carcinomas are asymptomatic, they cause the patient very little or no pain. If one is keen and can get to examine the patient on one of his routine birthday examinations one can detect carcinoma by putting the finger in the rectum and palpating the prostate. In the urine, one may see an increase in epithelial cells or occasionally a few red blood cells. If these conditions are found one should have the courage to insist that the patient submit without delay, to a complete urologic examination, including cystoscopy and roentgenology. The number of cases of carcinoma that will be obtained in this way are relatively few. The second circumstance that brings the patient to the urologist is the sign hematuria. These patients wake up in the morning urinate, and see a red, brown or black fluid issuing forth. Immediately they go to the telephone and call the doctor, but the doctor is not there. They fuss around a little bit urinate again and find the good old yellow color back again. At once they forget the doctor and go about their affairs. Then in six months or a year, they have a recurrence of their hematuria and they appear for a urologic examination. I feel that urologists should stress the point in all their contacts with medical colleagues and medical students that hematuria no matter how slight or how soon stopped, calls for a complete urologic examination.

DR FRANK HINMAN, San Francisco I wish to reopen the controversy of transurethral resection and perineal prostatectomy. I think it is proper in view of Dr Lewis's remarks. The reason that I wish to do this is that I think the point of Dr Young's paper has been entirely overlooked. Hyperplasia of the prostate does not always occur as an isolated condition, and any method of treatment which always treats it as an isolated condition does not conform to the highest standard of cure. We know that infections in the prostate, stones of the prostate, and carcinoma of the prostate are frequently associated with hyperplasia. Carcinoma occurs in two forms: primary carcinoma in the posterior lobe and primary carcinoma that occurs in the hyperplasia itself. In a recent paper, a histologic study by Heynischak in Vienna showed that 3 per cent of the prostates removed by suprapubic prostatectomy had carcinoma in them unsuspected. These patients before operation presumably were all cured by removal of this hyperplasia. It seems to me that the matter has degenerated into more or less of a question of choice of the operator himself. Perineal prostatectomy not only conserves in certain cases the sexual function and not only restores the ability to urinate normally but it gives an opportunity to treat these associated conditions, and particularly the carcinoma. The perineal route is the only method by which one can radically remove carcinoma of the prostate, the perineal route is the only method by which stones can be radically removed, and therefore, in a consideration of the standard of cure a method that does not take into consideration this association does not conform to the highest standard of cure.

QUININE IN MYOTONIA AND PROSTIGMINE IN MYASTHENIA

A CLINICAL EVALUATION

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With Walker's¹ discovery that prostigmine alleviates the muscular weakness of myasthenia gravis and Wolf's² finding that quinine abolishes the myotonus of congenital and atrophic myotonia, new impetus was given to the study of the pathophysiology of these disorders. The clinical observation³ that prostigmine exaggerates myotonia and that quinine exaggerates myasthenia established a relationship of opposition in response to drugs that accentuated the obvious contrast between these muscular states. It is this contrast that makes appropriate a comparative evaluation of their symptomatic response to pharmacologic antagonists.

It is two years since Walker's¹ contribution and one year since Wolf's² suggested the use of quinine, so that an appraisal of the clinical usefulness of prostigmine and quinine is due. In this period we have studied, seen or been in indirect contact with nine patients with myasthenia gravis, nine patients with myotonia congenita and eighteen patients with myotonia atrophica.

Every patient with myasthenia gravis showed an immediate excellent response to prostigmine, with generalized increase in muscular power. Patients previously bedridden and gasping for breath became

ambulatory and took light exercise. However, within one to four months four patients began to show a progressively poorer response to prostigmine, so that the dose had to be increased gradually to maintain swallowing and aid respiration. In spite of increases in medication of from two to ten, fifteen and even twenty-four ampules (0.5 mg per ampule) in twenty-four hours, these patients were at times almost at the point of death. Even with these high doses no painful peristalsis occurred. Sweating, however, was marked in all cases. It seemed that, if prostigmine was given beyond a certain point, patients became refractory toward its beneficial effects. Yet if insufficient prostigmine was given, respiration became labored and swallowing impossible. Accordingly, the administration of prostigmine was discontinued for from thirty-six to forty-eight hours during which time the administration of potassium chloride and ephedrine sulfate was pushed to a point just below intolerance. Orders were left to institute artificial respiration and to give prostigmine in case of emergency. Swallowing became impossible, so that feeding by tube was required. After from thirty-six to forty-eight hours prostigmine medication was resumed in one case with one ampule (0.5 mg) twice a day. This patient showed a much better response to two ampules after a two day abstinence than she previously had to twenty-four ampules. Gradually, however, her medication has had to be increased to twelve ampules a day, and again she is much less responsive. A second patient, formerly given from eighteen to twenty-four ampules, has maintained a fair degree of strength while receiving four ampules a day after a two day abstinence. A third patient was formerly given from eighteen to twenty-four ampules, despite which swallowing remained impossible. He has had no prostigmine now for four months and shows few signs of deprivation. He may be in a state of spontaneous remission. The dosage in the fourth case has not yet been reduced.

Why certain of our patients should after a while become refractory to prostigmine is not clear, nor can we be certain that the patients who have responded well so far will not at some time become refractory. In theoretical explanation it could be postulated that choline esterase keeps increasing in the blood, requiring constantly higher concentrations of prostigmine. This notion is difficult to maintain in the light of contradictory reports on the blood choline esterase in patients with myasthenia gravis. Stedman⁴ obtained low value. McGeorge⁵ reported three cases of myasthenia gravis in which the activity of the serum esterase was well within normal limits and showed little variation from day to day. However, Brown Dale and Feldberg⁶ have stressed the importance of the local concentration of acetylcholine at the end-plate. One can imagine the concentration of choline esterase at the myoneural junction as excessive, a state unrevealed by study of the blood. Another possibility is the periodic exhaustion of acetylcholine at the end-plate. At such time it would not matter how strongly esterase was inhibited by any quantity of prostigmine. A key to this problem may lie in Boothby's⁷ clinical observation and we can

This work has been done under the auspices of the Child Neurology Research Foundation.

Read before the Section on Nervous and Mental Diseases at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J. June 10, 1937.

1 Walker Mary. Case Showing Effect of Prostigmin on Myasthenia Gravis. *Proc. Roy. Soc. Med.* 28: 759-761 (April) 1935.

2 Wolf Alexander. Quinine. An Effective Form of Treatment for Myotonia. *Arch. Neurol. & Psychiat.* 36: 382-383 (Aug.) 1936.

3 Kennedy Foster and Wolf Alexander. Experiments with Quinine and Prostigmin in Treatment of Myotonia and Myasthenia. *Arch. Neurol. & Psychiat.* 37: 68-74 (Jan.) 1937.

4 Stedman Edgar. The Choline Esterase Content of Blood in Myasthenia Gravis. *J. Physiol.* 84: 56P (July) 1935.

5 McGeorge Murray. Choline Esterase Activity in Disease. Special Reference to Myasthenia Gravis. *Lancet* 1: 69-72 (Jan. 9) 1937.

6 Brown G. L., Dale H. H. and Feldberg W. Normal Mammalian Muscle to Acetylcholine and to Error. *J. Biol. Chem.* 87: 394-424 (Sept. 8) 1936.

7 Boothby W. M. Myasthenia Gravis. *Ann. Int. Med.* 2: 411-414 (Aug.) 1935.

confirm this, that there is a definite correlation between the patient's general condition and the amount of dry, stringy oral mucus. The production of this mucus is more marked when the patient is worse. It appears to us that this dry, viscous mucus makes its appearance only when there is inadequate flowing salivation. Stavraký⁸ quotes an experiment by Heidenhain,⁹ in which he paralyzed the secretory effects of the chorda tympani with quinine although the sympathetic nerve still acted. It follows that the vagus hormone or parasympathetic stimulation produces watery salivation and that in extreme myasthenic states there is a deficiency of acetylcholine resulting in inadequate salivation and dry oral mucus. Yet the supposition of myoneural acetylcholine insufficiency wears thin under the experimental observation that acetylcholine or acetyl-beta-methylcholine administered at such times does not increase muscular power.

The refractory character of prostigmine after an early extended period of usefulness has been noted by other investigators. Minski and Stokes¹⁰ noted immediate toxic symptoms, alimentary, cardiovascular and nervous, causing complete prostration. We have not seen such symptoms except after prolonged and excessive medication. But Minski and Stokes stated that it is hopeless to undertake continuous treatment with prostigmine outside the hospital. They confirmed the remarkable specific effect of prostigmine but said its usefulness is limited. We, however, have been able to administer prostigmine hypodermically or orally to four patients outside the hospital for many months. Hyland¹¹ pointed out the dramatic but transient relief from symptoms in four patients and warned against repeated administration on the grounds that it may be followed by alarmingly increased weakness. He admitted, however, that there are several cases on record in which rather large doses were given every day without ill effect. Boothby¹² has emphasized that treatment with prostigmine may be followed by mental depression and greater weakness after early improvement. C. K. Russel¹³ described his experience with a case of myasthenia gravis. "It was disappointing that, while the effect lasted for four or five hours, there resulted what seemed to be a decided let-down, and he was not nearly so well after the injection, so I felt hesitant about repeating it more often than was necessary. I had to put him in the Drinker respirator, and the use of the respirator and the drug was continued for several days, but he finally died. The let-down about five or six hours after the administration of the prostigmine seemed to me a serious disadvantage." Harvey and Whitehill,¹⁴ while granting that prostigmine produces striking immediate improvement and seems at present to be the most valuable therapeutic agent, described three patients in whom beneficial effects decreased with the continued use of the drug until they died. Another patient never became able to walk about in spite of 15 mg nine or ten times a day. In a fifth patient,

although prostigmine, 30 mg three times a day, helped chewing, swallowing and diplopia, its effects wore off in from two to three hours, and the patient thought his muscular weakness was worse than before the drug was taken.

It is our belief that prostigmine given in doses of from 15 to 30 mg two or three times a day may be life saving, but if given over a considerable period in excess of this dosage or over too long a time in this low dosage, it may become intoxicating and result in death. Prostigmine facilitates the action of acetylcholine and so stimulates the voluntary muscles via the myoneural junction, but in large doses it appears to exert a curare-like effect, which very likely results in weakness, then paralysis and finally death, when the respiratory muscles become affected. The optimum dose must lie in the marginal safety zone between prostigmine stimulation and prostigmine "curarization" of the motor end-plate. This dose varies for each patient.

Our experience with quinine in the treatment of myotonus extends over six cases of myotonia congenita and fifteen cases of myotonia atrophica for a period of one year. In addition we know through personal communication from a physician in another hospital of three cases of myotonia atrophica. Smith¹⁵ has recently reported three cases of myotonia congenita the symptoms of which were entirely abolished by quinine. In each patient of our series from 2½ to 5, 10 or 15 grains (0.16 to 0.32, 0.64 or 0.96 Gm) of quinine hydrochloride by mouth two or three times a day eliminated every vestige of myotonus. Any form of quinine may be used, for example, hydrochloride, sulfate, bisulfate or hydrobromide. Of the group, however, the hydrochloride appears to be the most soluble and quickly absorbed without disturbing gastro-intestinal effects. The hydrobromide may be used with "nervous" patients.

An explanation of the continuous neutralization of myotonus lies in the maintenance of an almost constant level of quinine after it is administered by mouth.¹⁶ The drug can be detected in the blood for about twenty-five hours, a good deal longer than if given intravenously. The blood quinine content does not rise above 3 per cent of the dose given. Hartmann and Zila¹⁷ demonstrated that after intravenous injection of 0.5 Gm of quinine the concentration in the blood fell quickly at first, then steadily more slowly, until after eight hours none was left. When quinine was taken by mouth the blood quinine content was lower but was nearly constant for about twenty-four hours. Quinine is absorbed slowly. Part of it circulates in the blood before excretion unchanged in the urine. About one third is excreted within twenty-four hours.¹⁸ The remainder is destroyed by the body metabolism.¹⁹ In only one patient (J. P.) was there a sign of cinchonism, evidenced by ringing in the ears. This occurred when she took 10 grains (0.64 Gm) of quinine hydrochloride three times a day by mouth. Doses of 5 grains (0.32

⁸ Stavraký G. W. Effect of Quinine on the Parasympathetic and Sympathetic Innervation of the Salivary Glands. *J. Pharmacol. & Exper. Therap.* **47**: 321-338 (March) 1933.

⁹ Heidenhain R. *Stud. d. Physiol. Inst. zu Breslau* **4**: 85-1868.

¹⁰ Minski Louis and Stokes A. B. Treatment of Myasthenia Gravis. *Brit. M. J.* **1**: 1095-1098 (May 30) 1936.

¹¹ Hyland H. H. Treatment of Myasthenia Gravis. *Canad. M. A. J.* **35**: 372-381 (Oct.) 1936.

¹² Boothby W. M. Myasthenia Gravis. Eighth Report. *Tr. A. Am. Physicians* **51**: 188-198 1936.

¹³ Russel C. K. in discussion of Winkelman N. W. and Moore M. T. Prostigmin in the Treatment of Myasthenia Gravis and Muscular Dystrophy. *Arch. Neurol. & Psychiat.* **37**: 237-252 (Feb.) 1937.

¹⁴ Harvey A. M. and Whitehill M. R. Prostigmin as an Aid in the Diagnosis of Myasthenia Gravis. *J. A. M. A.* **108**: 1329-1333 (April 17) 1937.

¹⁵ Smith W. A. Quinine Treatment of Myotonia Congenita. *J. A. M. A.* **108**: 43 (Jan. 2) 1937.

¹⁶ Meyer H. H. and Gottlieb R. Experimental Pharmacology as a Basis for Therapeutics translated by A. E. Henderson. Philadelphia J. B. Lippincott Company 1926 p. 561.

¹⁷ Hartmann H. and Zila I. Ueber die sogenannte Chinungewohnung. *Munchen. med. Wehnschr.* **64**: 1597-1917.

¹⁸ Giemsa G. Ueber die therapeutische Verwerthbarkeit der freien Chininbase. *Arch. f. Schiffs- u. Tropen Hyg.* **11**: 300-302 1907. Nishi M. Ueber eine neue Bestimmungsmethode des Chinins und uiber seine Ausscheidung im Harn. *Arch. f. exper. Path. u. Pharmacol.* **60**: 312-323 1909.

¹⁹ Grosser P. Ueber das Verhalten des Chinins im Organismus. *Biochem. Ztschr.* **8**: 98-117 1908.

Gm) three times a day were well tolerated and adequate to eliminate symptoms

In every case of myotonia congenita quinine proved to be of unique value. When administration of the drug was stopped, evidence of myotonia returned within twenty-four hours but was not complete before seventy-two hours. Patients consistently asked for quinine when it was not given, insisting on its beneficial subjective effect. The solution of myotonus was equally evident on objective examination, even to the dissolving of percussion myotonus in the voluntary muscles, including the tongue. In rare instances when myotonia was not evident on volition, a remnant of it could be elicited on percussion.

In cases of myotonia atrophica, although quinine readily neutralized myotonic reactions, it had less clinical usefulness. The reason for this is simple. The patient with the atrophic variety of myotonia is incapacitated much more by atrophy than by myotonus. In at least two or three patients the stage of myotonia had been outlived or had never developed. Yet there was no question that they belonged in this diagnostic class. Only three of eighteen patients with atrophic myotonia demanded to continue taking quinine, indicating a need and appreciation of the drug not evident in the others.

One man with myotonia congenita and one woman with myotonia atrophica appeared to have a slight decrease in myotonus for several weeks after they stopped taking the drug. The man had used quinine for ten months, the woman had used it for three months. Whether this partial release from myotonia will be transient or permanent remains to be seen.

In a previous paper we² reported the exaggeration of myotonia by prostigmine. We have since been able to confirm Russell and Stedman's²⁰ similar experience with potassium, which piles up more evidence for the brief of pharmacologic antagonism between myotonia and myasthenia. We have also confirmed Stedman's Scottish observation that alcohol given by mouth reduces myotonus considerably. Its sole disadvantage is of course chronic inebriation and the exciting to envy of less fortunate patients, not to speak of some damage to the discipline of the wards. Possibly, however, these by-products of this therapy would naturally attract little or no attention north of the Tweed.

We have been confronted with cases of supposed myotonia congenita in which the attending physician protested that quinine was ineffective. Careful examination showed the patients to be suffering from other disorders, such as hemiplegic spasticity or tetany. This led to an investigation of the effect of quinine and prostigmine on other neuromuscular disorders. Before recording our own experience we shall mention that of others. Everts²¹ employed prostigmine in cases of myotonia congenita, alcoholic polyneuritis, postencephalitic parkinsonism, facioscapulohumeral myopathy and amyotrophic lateral sclerosis. Some improvement followed, but the patients were not treated regularly or for a sufficiently long period. It is curious to find that Everts noted improvement in patients with myotonia following the administration of prostigmine. We have given this drug many times in cases of myotonia and found the myotonus to be consistently exaggerated.

Winkelman and Moore²² reported two of four patients with pseudohypertrophic muscular dystrophy who improved after taking prostigmine, one with "muscular dystrophy" who responded favorably, and one with scapulohumeral muscular dystrophy (Erb) and one with amyotrophic lateral sclerosis who failed to improve. The majority of the patients with myasthenia gravis had received ephedrine or aminoacetic acid or both for an extended period without any appreciable improvement. Our experience with aminoacetic acid (glycine) in the treatment of myasthenia gravis has likewise been discouraging. Hamill and Walker²³ reported increased motor power in cases of amyotrophic lateral sclerosis following the use of moderate doses of prostigmine. Hurwitz and Gerstle²⁴ found no improvement in patients with myotonia congenita after treatment with physostigmine and prostigmine.

We have used prostigmine and quinine in one case of chronic chorea, two of ordinary chorea, one of hemi-athetosis, a dozen of spasticity associated with hemiplegia, one of tic involving the facial and cervical muscles, a dozen of chronic encephalitis, two of spasmodic torticollis, one of myotonia congenita, two of progressive muscular dystrophy, one of Westphal's pseudosclerosis and one of ophthalmoplegia caused by botulism. One patient with the facioscapulohumeral myopathy of Landouzy and Dejerine showed some slight subjective and objective improvement after taking 0.5 mg. of prostigmine subcutaneously three times a day. When this dose was given five times a day, extreme weakness appeared, apparently a "curare" effect from excess prostigmine.

We² have reported elsewhere an experiment which indicates that the myotonic phenomenon is due to a pathophysiologic state resident in muscle or at the myoneuronal junction independent of the spinal neuronal reflex arc. Since myotonia and myasthenia appear to be counterparts responding to pharmacologic antagonists, and since myasthenia is conceived as a state in which there is excess choline esterase or inadequate acetylcholine at the motor end-plate, myotonic phenomena are in all likelihood due to an accumulation of acetylcholine or to an insufficient concentration of choline esterase at the motor end-plate. Yet it is difficult to imagine how myotonus could be due to excess acetylcholine, when atropine, an antagonist of acetylcholine, has little or no effect on the disease. Maybe the parasympathetic "stuff" at the motor end plate or in muscle in this disease is somehow unaffected by atropine.

To test and confirm our notion of the localization of the pathophysiologic site in myotonia and myasthenia 500 cc. of whole blood was transfused from a patient with myotonia congenita (J. D.) to a patient with myasthenia gravis (J. F.). Our feeling was that if the diseases were pathophysiologic opposites we might transfer parasympathetic "stuff" from the one to the other to produce a transient neutralization of myasthenic weakness and increase strength. The converse in a sense, of this experiment, the transfusion of 500 cc. of whole blood from a normal individual (F. Q.) to a patient with myotonia congenita (J. D.), was also

20 Russell W. R. and Stedman Edgar. Observations on Myotonia. *Lancet* 2: 742-743 (Sept. 26) 1936.

21 Everts W. H. The Treatment of Myasthenia Gravis by the Oral Administration of Prostigmine. *Bull. Neurol. Inst. New York* 4: 250-250 (Dec.) 1935.

22 Winkelman N. W. and Moore M. T. Prostigmin in the Treatment of Myasthenia Gravis. *Arch. Neurol. & Psychiat.* 37: 357 (Feb.) 1937.

23 Hamill P. and Walker M. B. The Action of Prostigmine (Roche) in Neuromuscular Disorders. *J. Physiol.* 84: 36-37P (May 1935).

24 Hurwitz Samuel and Gerstle Mark Jr. Amyotonia Gravis with Familial Incidence. *Arch. Neurol. & Psychiat.* 33: 1317-1323 (Oct.) 1935.

performed but was not followed by diminished percussion or volitional myotonus. In the first procedure it was anticipated that the hypothetical excess of acetylcholine in the myotonic patient could be transferred to the myasthenic subject who suffered from a supposed lack of the vagus hormone. In the second experiment it was believed that the normal concentration of choline esterase in the blood of the unaffected individual might neutralize the "excess acetylcholine" in myotonia. No change in muscular symptoms was noted. This experiment confirmed our belief that the pathologic change of these disorders lies in muscle or at the myoneural junction. In a previous experiment we³ established the innocence of the spinal reflex arc, and now the blood is seen not to carry the offending "stuff" in concentrations great enough to affect the disordered muscles or end-plates.

Dr H G Wolff,²⁵ in order to ascertain whether the constriction of the pupil is due to action of acetylcholine, the radial muscle of the iris or parasympathetic nerve endings, allowed the postganglionic parasympathetic nerve fibers to degenerate after removal of the ciliary ganglion in three cats. Acetylcholine, injected into the anterior chamber of the eye, produced miosis. This experiment indicated "that, at least for the iris of the cat, the action of acetylcholine is peripheral to the postganglionic fibers and presumably direct on the radial muscles."

Elsewhere Wolff has demonstrated the increased vascularity of nervous tissue at synapses, presumably because here there is an important metabolic process going on—the conduction of an impulse from an axon to a dendrite by acetylcholine, a process requiring oxygen and furnished by the increased blood supply. Binz²⁶ said that the action of quinine as a cell toxin is due to interference with oxidation and showed that the changes produced in lower organisms by quinine are similar to those produced by lack of oxygen. Quinine probably interferes with oxidative processes at the synapse and the myoneural junction, depressing the action of acetylcholine.

Meyer and Gottlieb²⁷ cited Hoffman and Laqueur²⁸ in the statement that "the acid formation in blood from a vein is inhibited, and the formation of hippuric acid from benzoic acid and glycocholl [aminoacetic acid], when added to the blood perfused through the kidney, is decreased by quinine." The idea of inhibition of acid formation by quinine associates itself with the fact that acetylcholine is destroyed in an alkaline medium, being stable and preserved only in an acid medium.²⁹ Fuhner³⁰ too has demonstrated that acetylcholine is protected from esterase by increased hydrogen concentration, i. e., increased carbon dioxide tension. Perhaps the acidity (lactic?) of muscle in myasthenia is decreased as a result of some metabolic disturbance, thus neutralizing the expression of neural impulses,

which finally depend on acetylcholine ineffectual in too low an acid, neutral or alkaline medium. Conversely, the acidity of myotonic muscle may be such as to stabilize and implement the action of acetylcholine. Of course this idea is purely theoretical and only a guide to research. Speaking of congenital myotonia as far back as 1891, Jolly³¹ speculated that the cause might be found rather in a disturbance in muscular chemistry than in the well known anatomic changes in muscle. His theory of half a century ago is more nearly fact today.

SUMMARY AND CONCLUSIONS

Eighteen patients with myotonia atrophica and nine patients with myotonia congenita have been treated with quinine in the past year.

Quinine abolishes myotonus for as long as it is administered.

In two patients there was some diminution of myotonus after the administration of quinine was discontinued.

From 2½ to 5, 10 or 15 grains of quinine hydrochloride two or three times a day given by mouth has consistently eliminated myotonus as a disturbing symptom.

Nine patients with myasthenia gravis have been treated with prostigmine in the past year and a half.

Five patients have been restored to normal activity by 0.5 mg of prostigmine given subcutaneously three or four times a day or one or two tablets (15 mg per tablet) three times a day.

After early improvement four patients have become progressively worse as prostigmine medication was increased.

Increasing the dose of prostigmine appears to aggravate myasthenic weakness, probably by "curare-like" action.

Reduction of the dosage of prostigmine in these cases was followed by improvement.

Quinine and prostigmine have been assayed in the treatment of a good many other muscular disorders and found to be without benefit except in one case of facioscapulohumeral myopathy of Landouzy and Dejerine.

There is additional experimental evidence that myotonia and myasthenia are primary disorders of muscle or the myoneural junction.

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ABSTRACT OF DISCUSSION

DR PETER BASSOE, Chicago. The choice of me to open this discussion on muscular dystrophy is unfortunate, because not only have I little experience with the treatment of such cases but I confess to a certain lukewarm interest. I am tremendously interested in the prevention of muscular dystrophy. Physicians have been negligent because they know that muscular dystrophy really is a hereditary disease, and if they get the public to understand that it is a crime for people belonging to families with that disease to have children, this disease as civilization progresses will disappear from the earth. I know it is painful to do it. I remember how unhappy a young woman was who came to my office. Her father and her brother had dystrophy and she herself had a stationary form, but I felt it was my duty to tell her—she wanted to get married—"It is all right for you to get married, but you should be sterilized first." With regard to myasthenia gravis what little experience I have had with prostigmine has been extremely happy. Results have been most spectacular. Patients I have had under treat-

25 Wolff H G. Site of Action of Acetylcholine and Its Significance read before the Philadelphia Neurological Society, March 27, 1936.

26 Binz C. quoted in an abstract of Wolfe Eugene. Causation of Quinine Blindness. *Lancet* 1, 1496-1497 (June 29) 1935 in *Arch Neurol & Psychiat* 855 (Oct.) 1936.

27 Meyer and Gottlieb. Experimental Pharmacology as a Basis for Therapeutics, p. 501.

28 Hoffman A. Ueber die Hippursäurebildung in der Niere. *Arch exper Path u Pharmacol* 7, 233-246, 1877. Laqueur E. Ueber die Wirkung des Chins auf Fermente mit Rücksicht auf seine Beeinflussung des Stoffwechsels. *Arch f exper Path u Pharmacol* 55, 240-262, 1906.

29 Buth H R. Chemical Mediation of Nerve Impulses. *Arch Neurol & Psychiat* 37, 142-153 (Jan.) 1937.

30 Fuhner H. cited by Minz B. Pharmakologische Untersuchungen am Blutgefäßpräparat. *Arch f exper Path u Pharmacol* 168, 292-304, 1932, cited by Lambert Alexander. The Action of the Autonomic Nervous System as an Explanation for the Therapeutic Value of the Carbolic Acid Baths in Degenerative Cardiac Disease. *New York State J Med* 35, 146-156 (Feb. 15) 1935.

31 Jolly F. Ueber das elektrische Verhalten der Nerven und Muskeln bei Thomsen'scher Krankheit. *Arch f Psychiat* 22, S. 521, 1891.

ment for something like a year and a half have not had any ill effects. The dosage has been decreased and the effect more prolonged. When I began with these patients they were in bad condition. It was necessary to give them prostigmine by injection because they couldn't eat. I soon found that the result would carry over. For instance, a dose given at 5:30 in the evening enabled the patient to eat supper and also breakfast and then I changed, in those patients, to the prostigmine tablets, to be given by mouth. The results were satisfactory and I have an idea that perhaps the effect of the preparation taken by mouth is more prolonged. I have found prostigmine useful in cases difficult of diagnosis between myasthenia gravis and various other disorders. I found that the failure of any response to prostigmine settled the diagnosis in favor of something else rather than myasthenia gravis.

DR B. LANDIS ELLIOTT, Kansas City, Mo. This is a field in which there are many difficulties, both in diagnosis and in therapy. However, therapy has undergone rapid development recently. It might be said that in the case of myotonia and the muscular dystrophies there hasn't been any treatment worthy of the name until these recent communications. Until Dr. Wolf pointed out the value of quinine in myotonia there was nothing effective. A change has occurred in the emphasis on the line of attack in these diseases. There are many facts in the case of myasthenia gravis and myotonia particularly pointing to a possible endocrine origin. There is certain experimental evidence that endocrine disturbances affect the contractility of the muscle and in myxedema, for example, it has been pointed out that there is sometimes a hyperexcitability of muscle. There are a great many facts which cannot be harmonized by any theory or hypothesis yet put forward. At present the emphasis has shifted to the myoneural junction. It mustn't be forgotten, however, that the changes in muscle still demand explanation. The discovery of the action of quinine on myotonia is an important advance. It can be administered without much difficulty except for occasional idiosyncrasy, and there is some evidence that the effect may persist.

DR H. E. HINWICH, Albany, N. Y. It has been suggested that the primary site of the lesion may be in the myoneural junction or in the muscle. It is possible that there may be a primary site in the myoneural junction and that the lesions in the muscle are secondary. In some preliminary work done in the laboratory in Albany the effect of quinine on the production of acetylcholine by brain slices has recently been studied. It was found that in the presence of minute amounts of quinine the production of acetylcholine was diminished. This seems to be suggestive, even though obtained on another tissue and not on the myoneural junction, that the therapeutic effect of quinine may be produced by diminishing the production of acetylcholine.

DR KARL ROTHSCHILD, New Brunswick, N. J. I had the same experience with prostigmine that Dr. Bassoe reports, the drug seeming to act better when taken by mouth. Patients take one, two or three tablets daily. I have found in a woman of 68 with myasthenia gravis, in itself an unusual case, that she has been doing well for about a year and a half with a decreasing amount of prostigmine by mouth. She reports that she does considerably better than with subcutaneous injections which I had originally given her. I should like to mention a case of amyotonia congenita in a child aged 6 months, who has done exceptionally well with a relatively large amount, almost the adult dose, of prostigmine.

DR ALEXANDER WOLF, New York. Dr. Kennedy and I are aware that there are many endocrine changes in myasthenia gravis and in myotonia congenita. We know of cases of myotonia congenita with myxedema and have seen several cases of myasthenia gravis with exophthalmic goiter. We feel, however, that a great deal of responsibility for the symptoms lies at the motor end plate. It is interesting to hear that acetylcholine is diminished in the brain on the administration of quinine. We gave quinine after a spinal anesthesia and myotonia disappeared. In the light of this experiment it is our belief that quinine inhibits acetylcholine at the motor end plate or in muscle.

THE EFFECT OF DIURESIS BY MERCURIALS

ON THE CLINICAL COURSE OF CONGESTIVE HEART FAILURE

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The course of congestive heart failure is so variable that statistical studies fail to complete a pattern which can guide the physician in determining the life expectancy of an individual patient. Dyspnea, usually the first sign of congestive failure, may exist for years before other signs develop. Some patients have rapidly increasing dyspnea, orthopnea and visceral stasis and die within a few weeks or months. The variations observed in these extremes and the intermediate variations can be explained by several factors, such as age of the patient, extensiveness of the etiologic agent complicating pathologic conditions and faithfulness of

TABLE 1—Comparison of Flaxman's Series with Patients Treated by Mercurial Diuresis

Duration of Symptoms	Dead		Living	
	Flaxman's Series	Series Receiving Mercurials	Flaxman's Series	Series Receiving Mercurials
	Per Total Cent	Per Total Cent	Per Total Cent	Per Total Cent
1 day to 6 months	100	75	28	58
7 months to 1 year	24	13	7	14
1 to 5 years	18	10	12	26
Over 5 years	2	2	1	2

* All the living patients in this series were observed longer than one year.

TABLE 2—Incidence of Uremia

	Total	Deaths from Uremia	Deaths from Uremia Percent
Flaxman's series	189	31	16
Series treated with mercurial diuretics	60	21	35

the patient to the advice of his physician. Since statistics of mine or those of other observers can offer little aid in estimating the life span of patients with congestive failure, it is exceedingly difficult to determine the efficacy of a therapeutic agent for this condition. Opinions on the problem must for the most part rest on experience with thoroughly studied patients.

The treatment of the edema of congestive heart failure by mercurial diuretics has been practiced widely and with enthusiasm in recent years despite the fact that the removal of edematous fluid usually does not alter the progressive course of the underlying disease. Binger and Keith¹ commented on the complicated nature of the problem of edema and pointed out that there is no evidence to show that removal of edema has any curative effect on the primary disease. Nevertheless it is well known that edematous patients are symptomatically relieved by diuresis. It is also well known that rest in bed, digitalis and antithrombotic in some patients and at some time in the progress of

From the Department of Medicine, Northwestern University School of Medicine.
Read before the Section on Pharmacology and Therapeutics, Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1937.
¹ Binger, M. W., and Keith, N. M. The Effect of Different Types of Edema. J. A. M. A. 101: 2009 (Dec. 23) 1933.

disease fail to act as diuretics. The literature² contains abundant evidence of the success of mercurial diuretics (salyrgan, mercupurin, merbaphen) in patients who did not respond to the simpler diuretic regimen. There are also numerous reports³ of effective long-continued use of the drug with no harmful effects. A few reports deal with bad effects. Since merbaphen has been replaced, in general usage, by salyrgan and mercupurin, cases of mercurial nephritis are reported rarely.⁴ As the mercury is completely eliminated from the body within twenty-four hours after administration,⁵ an undesirable cumulative action is not feared. There are scattered reports of death after the use of diuresis produced by salyrgan. Immediate serious reactions with chill, rash and fever, ascribed to idiosyncrasy, have been reported by Cadbury⁶ and Wolf.⁷ The production of acute urinary retention in old men with large prostate glands has been attributed to the profuse diuresis produced by salyrgan.⁸ Recently another type of harmful effect has been suggested by Poll and Stein.⁹ They described a syndrome following mercurial diuresis which is characterized by preliminary symptoms of weakness, restlessness, mental confusion and psychosis, sometimes progressing to coma and death. Seven cases with three deaths were described. Because of poor turgor of the tissues, dry tongue, excessive thirst and recovery when salt and fluid were given, they attributed the syndrome to depletion of water and sodium chloride.

The present study was stimulated by the observation of occasional unfavorable reactions in some patients and an impression that the life expectancy of many patients was not prolonged even though edema was controlled. Further interest was stimulated by observation of patients who had uremic manifestations and died shortly after they had become edema free after prolonged mercurial diuresis. The following case report illustrates this feature.

C. S., a physician, aged 51, had had mild hypertension with slight albuminuria since 1918. No symptoms suggesting involvement of the heart or kidneys were present until bronchopneumonia developed in December 1935. Thereafter he noticed slight dyspnea on moderate exertion and occasional edema of the ankles. On April 15, 1936, the dyspnea was so severe that he was confined to bed, and progressive generalized edema ensued in the following two weeks. There was no significant diuretic response to the regimen of rest in bed, restriction of salt, digitalization and administration of xanthine diuretics. By July 5, 1936, the edema had caused a 20 pound (9 Kg.) increase in weight, the blood pressure was 186 systolic 124 diastolic, albumin and casts were found in the urine, examination of the blood revealed 40 mg. of nonprotein nitrogen per

hundred cubic centimeters and an electrocardiographic tracing revealed intraventricular block. Three days after the administration of ammonium chloride was started, 1 cc. of salyrgan was administered, and the dose was repeated at four day intervals from July 8 to October 2. A positive diuretic response (from 1000 to 3,000 cc. net), usually lasting three days, occurred after each injection. During this period there was symptomatic improvement and a loss in weight of 40 pounds (18 Kg.) and the patient became edema free. One week before the last injection of salyrgan was given distaste for food, nausea, mental irritability and insomnia developed. The albuminuria had increased, and the nonprotein nitrogen content had risen to 70 mg. per hundred cubic centimeters. The mental irritability progressed to somnolence, stupor and coma, with death occurring Oct. 30, 1936, at which time a frost of uremic crystals was present on his face. At the time of death there was no edema of the lungs, subcutaneous tissue or serous cavities.

For a study of the duration of life of patients with congestive failure I selected a group of patients with hypertensive and arteriosclerotic heart disease from ward 25, Cook County Hospital, who were treated

TABLE 3—Uremic Symptoms

Clinical Manifestations	Pathogenesis	Similar Changes in Mercurial Diuresis
Physical apathy, mental apathy, stupor, coma	Accumulation of aromatic phenol derivatives, chloride deficiency, magnesium excess (?)	Plasma chloride deficiency a common effect
Increase of neuro muscular irritability	Diminution of ionized calcium, accumulation of substances forming un ionized calcium salts, excessive guanidine	Not observed
Tachypnea, cardiac asthma, acute pulmonary edema, slow deep breathing	Failure of the left side of the heart, Acidosis	Necessary for mercurial diuresis
Stertorous breathing and periodic breathing	Associated cerebral vascular changes, congestive heart failure, phosphate retention	Not observed
Lowered blood pressure	Effect of dehydration on phenols	Dehydration the desired effect
Vomiting	Bacterial action in gastrointestinal tract on secreted urea producing ammonium salts	Increased concentration of blood urea
Anemia, Purpuric manifestations	Retention of phenols, Calcium ion deficit	

during 1935. The duration of life after the onset of congestive failure of the group treated with intravenous mercurial diuretics is compared with that of a group of patients from the same hospital studied and reported by Flaxman.¹⁰ Table 1 gives the results of this comparative study. Minor differences in the lapse of time between onset of symptoms and death are too insignificant to allow the conclusion that mercurial diuretics alter the life span. Neither can any encouragement be derived from the fact that only twelve of sixty patients treated in 1935 are still alive.

The incidence of uremia in the patients who died is listed and compared with Flaxman's results in table 2. The incidence of uremia is more than doubled in the group which received mercurial diuretics. There is an obvious difficulty and hazard in drawing conclusions from this comparison because uremia is such an ill defined syndrome. Flaxman does not state the criteria for his diagnosis of uremia. A syndrome of mental and gastro-intestinal symptoms associated with nitrogenous retention and impaired function of the kidneys was the basis of diagnosis in my series. One cannot

² Sprague H. B. and Graybiel: Salyrgan as a Diuretic. Report of 60 Cases. New England J. Med. **204**: 154 (Jan. 22) 1931. Agnew G. H.: Salyrgan as a Diuretic. Canad. M. A. J. **18**: 45 (Jan.) 1928. Baunick E. G. and Keith N. M.: Treatment of Nephritis and Nephrosis with Edema. J. A. M. A. **91**: 1944 (Dec. 22) 1928. Barker M. H. and O'Hare J. P.: Use of Salyrgan in Edema. J. A. M. A. **91**: 2060 (Dec. 29) 1928. Christian H. A.: Types of Edema and Their Treatment. New England J. Med. **209**: 1267 (Dec. 21) 1933.

³ Dixon J. M.: Salyrgan. Its Long Continued Use in Cardiac Failure. New England J. Med. **211**: 810 (April 12) 1934. Kramer L. I.: Salyrgan. Its Use Over an Extended Period of Time to Relieve Cardiac Insufficiency. Rhode Island M. J. **17**: 175 (Oct.) 1934. Wiseman J. R.: The Prolonged Use of Salyrgan as a Diuretic. Report of Two Hundred and Seventy Injections in Five Years in One Case. J. A. M. A. **99**: 114 (July 9) 1932.

⁴ Tarr Leonard and Jacobson Sheldon: Toxicity of Mersalyl (Salyrgan). A Clinical and Anatomic Study. Arch. Int. Med. **50**: 158 (July) 1932.

⁵ Engel K. and Epstein T.: Die Quecksilberdiuretic. Ergebn. d. inn. Med. u. Kinderh. **10**: 187 1931.

⁶ Cadbury W. W.: Idiosyncrasy to Salyrgan. M. Papers. Christian Birthdays Vol. 1936 p. 259.

⁷ Wolf I. J.: Idiosyncrasy to Salyrgan. J. A. M. A. **102**: 1177 (April 7) 1934.

⁸ Tcherning Rudiger: Ueber Salyrgan. Deutsche med. Wochenschr. **53**: 1465 (Aug. 26) 1927.

⁹ Poll Daniel and Stern J. E.: Untoward Effects of Diuresis. Arch. Int. Med. **55**: 1057 (Dec.) 1936.

¹⁰ Flaxman Nathan: The Course of Hypertensive Heart Disease. Ann. Int. Med. **10**: 748 (Dec.) 1936.

conclude from this small series that mercurial diuretics have the capacity per se to produce uremia. They do point to the necessity of a critical study of the arterio-sclerotic patient with congestive failure before powerfully acting diuretics are used. Such patients as a class have general vascular disease and are likely candidates for uremia. In a recent review Harrison¹¹ emphasized the complicated nature of the problem of uremia. He stated that known and definite roles in the pathogenesis of uremia can be ascribed as follows: Calcium ion deficiency as the result of the retention of products forming unionized calcium salts is concerned in the initiation of motor irritative phenomena, retention of phenol derivatives is related to the stuporous state, accumulation of organic and inorganic

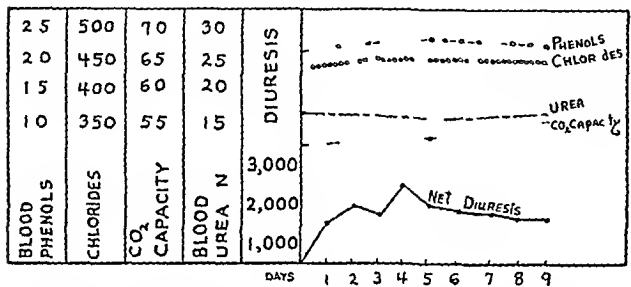


Chart 1—Moderate diuresis in a 50 year old patient as result of rest in bed. There was no significant change in the blood phenol, the chloride or the urea nitrogen content or in the carbon dioxide combining capacity.

acids plus a loss of base have a role in the production of respiratory disturbance, depletion of chloride and water increases the catabolism of protein and at the same time further impairs the ability of the body to excrete the resulting metabolites. An examination of the reports on effects produced by mercurial diuretics reveals certain metabolic changes that are similar to those found in uremia. For example, increased excretion of water and chloride and decreased chloride content of the blood plasma are not only consistent features of mercurial diuresis but are associated with the uremic state. The production of acidosis, which according to Christian¹² and his co-workers is necessary for effective

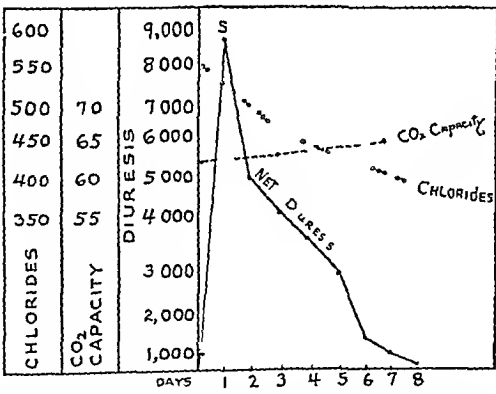


Chart 2—Marked prolonged diuresis associated with moderate fall in the plasma chloride content but no marked change in the carbon dioxide combining capacity. S—salyrgan 2 cc.

mercurial diuresis, may also be prominent in uremia. An increase in the concentration of blood urea, well known as a part of the uremic picture, has been observed

recently by Barker¹³ after diuresis produced by salyrgan. Blumgart¹⁴ has demonstrated increased excretion of sodium, potassium and calcium after mercurial diuresis, another possible factor in creating a metabolic disturbance. Table 3 contains a list of

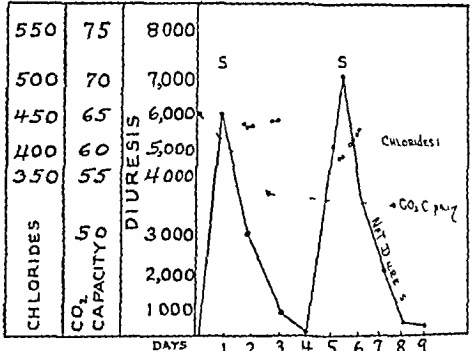


Chart 3—Progressive lowering of the carbon dioxide combining capacity and the chloride content after repeated doses of salyrgan. S—salyrgan 2 cc.

uremic symptoms, their pathogenesis, according to the review by Harrison, and a comparable list of effects known to be produced in mercurial diuresis.

As a consequence of this study each patient with congestive failure is subjected to a more critical study before salyrgan is used. To prevent possible harm the following plan is instituted:

- 1 Salyrgan is used only when rest, digitalis and xanthine diuretics fail to produce the desired diuretic response.
- 2 The preliminary examination includes estimates of the plasma chloride content, the urea nitrogen con-

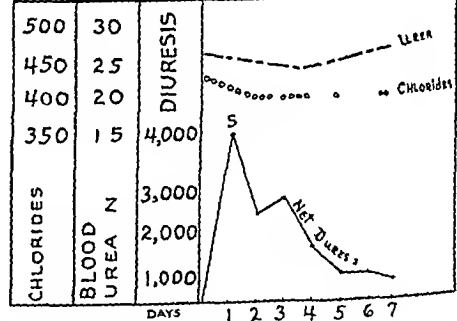


Chart 4—No significant changes in the urea nitrogen or the chloride content after moderate diuresis. S—salyrgan 1 cc.

tent, the carbon dioxide combining capacity and the blood phenol content, the drug is not given if markedly abnormal values are observed.

3 During the period of diuresis interval determinations are made, frequently if symptoms suggest the onset of uremia.

4 Marked lowering of the plasma chloride content if associated with mental symptoms points to a need for intravenous administration of saline solution.

5 Lowering of the carbon dioxide combining capacity with symptoms of acidosis requires restriction of ammonium chloride and administration of sodium bicarbonate and dextrose.

6 The first dose of salyrgan should be given intramuscularly to eliminate the danger of the rare hyper-sensitive reaction.

11 Harrison Tinsley R and Mason Morton F. Pathogenesis of the Uremic Syndrome. Medicine 16: 1 (Feb.) 1937.
12 Christian Henry A. Edema Diuretics Diuresis. Proc Inst Med Chicago 11: 149 (Nov. 15) 1936.

13 Barker N. Herbert. Personal communication to the author.
14 Blumgart Herman L. Action of Diuretic Drugs. N. Y. Christian Birthday Vol. 1936. p. 191.

7 Secretion of large amounts (from 5 to 10 liters daily) is more dangerous than secretion of smaller amounts, doses of from 0.25 to 0.5 cc in some cases produce an adequate response

Charts 1 to 5 present the results of examinations of the blood in five cases. There is no consistent picture either before or after mercurial diuresis. In some cases significant changes are brought about by the diuresis. Other evidence, previously quoted, substantiates the suspicion that marked diuresis is capable of instituting a metabolic upset which may have harmful effects on the patient. Further studies should be made to determine how such changes can be interpreted to the best advantage of the patient.

SUMMARY

A study of a series of hypertensive and arteriosclerotic patients with heart disease and congestive failure suggests a decrease in the duration of life after the use of mercurial diuretics. A high incidence of uremia was observed in the group. The known effects

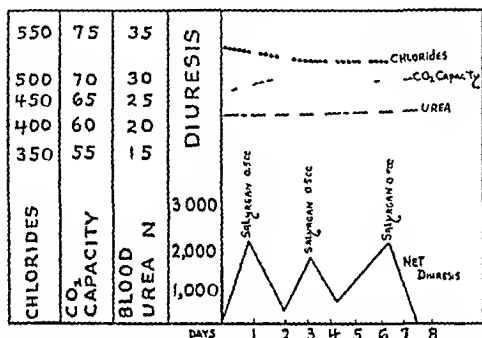


Chart 5—Slight diuretic responses to small doses of salyrgan at frequent intervals, no significant changes in the phenol content, the carbon dioxide combining capacity, the chloride content or the urea nitrogen content.

on the blood produced by mercurial diuretics show some points of similarity to the changes in the blood observed in uremia. Harmful effects from mercurial diuretics probably result from rapid removal of large quantities of edematous fluid rather than from mercurial damage to the kidneys. Mercurial diuretics should be used conservatively.

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ABSTRACT OF DISCUSSION

DR ARTHUR C DEGRAFF, New York. Dr Hines has rightly pointed out the difficulties that are encountered in determining the effect of mercurial diuretics on the life span of the patients. Any such study under controlled conditions at the present time would be impossible because I don't know of any one who is heartless enough to withhold mercurial diuretics from a patient who is markedly edematous and no longer responds to rest or digitalis. One has only to recall the fate of such patients in the premercurial diuretic era. Possibly one does not in any way lengthen the life and one may even, as Dr Hines suggests, shorten the life of some of these patients. Even so I do not believe that mercurial diuretics should be withheld. However the necessary precautions should be taken. Some of these Dr Hines has already pointed out. It is fortunate that the mercurials of the present day have a fairly low toxicity. Even so one must be sure that the mercurial content is low. The lower the mercurial content the less the possibility of kidney damage. There is the possibility that certain mercurial diuretics allow storage of mercury at the site of injection. Some work indicates that mercury is deposited at the site of injection and remains there for some time. The addition of theophylline to the mercurial diuretic will prevent such deposition of mercury

at the site of injection. A mercurial combined with theophylline will allow the more rapid absorption of the mercurial diuretic and prevent local deposition of mercury. The proper preparation of the patient is necessary. These patients must be given adequate bed rest to see whether bed rest alone will remove the edema. They must also no longer respond to adequate doses of digitalis and they must have an adequate salt balance. Also it is important to combine the mercurial diuretic with ammonium chloride to get its full effect. Dr Hines did not show in his cases how many had hypertension and what the results were before the mercurial diuretic was given. It is possible that a number of patients had severe kidney damage even before the mercurial diuretic was given. It is extremely difficult to make kidney function tests on patients who have marked edema. It would seem from my experience that the incidence of uremia in patients with congestive heart failure is not increased by the use of mercurial diuretics.

DR JAMES G. CARR, Chicago. Dr Hines has directed attention to a matter of clinical importance which heretofore has been generally neglected. The usual practice in the presence of marked edema occurring as a manifestation of congestive failure is to promote removal of the edematous fluid as promptly as possible. Dr Hines has laid stress on two features of this plan of therapy, the failure of the rapid removal of edematous fluid to prolong the life for most patients and the danger to life that may ensue on the too hasty depletion of the tissues. Even though life is not prolonged by control of the edema, the symptomatic relief of passive congestion is fraught with so much comfort to the patient that from this standpoint alone the attempt to relieve or prevent edematous accumulation is indicated. But this indication must be qualified and the practice modified, if it appears that dehydration may be dangerous to the patient. Dr Hines has made clear that a too rigid and rapid diuresis may be injurious even fatal, particularly to those afflicted with hypertensive and arteriosclerotic disease. In a recent paper, M. Herbert Barker remarked, "We are too frequently tempted to watch the urine volume curve or weight drop without sufficient regard to the concentration of the waste products which may be less easily eliminated. Certainly, during diuresis, the piling up of minerals or medication with a resultant acidosis, uremic state or drug poisoning readily occurs." My interest in this subject was stimulated by a recent experience with an elderly patient at the Evanston Hospital. A woman of 74 known to have been under treatment for cardiac disease for at least two years, was admitted to the hospital for the second time within a few weeks. The average daily output of urine under urginin and ammonium nitrate during the first six days was a trifle under 500 cc. On the seventh day she was given 1 cc of salyrgan, following which the twenty-four hour output rose to 1,380 cc. The patient's mental condition promptly became worse and she died on the third day thereafter. The blood chemistry was normal at the time of entrance. The exacerbation of her mental symptoms and the progressive failure of her general condition, appearing so abruptly after the use of the mercurial diuretic, with a marked increase of urinary output, were striking.

DR CHAUNCEY C. MAHER, Chicago. We are much indebted to Dr Hines for his accurate definition and timely warning of the possible unfavorable results with mercurial diuretics. In this group of patients with cardiac insufficiency and edema due to coronary thrombosis and myocardial infarction, a similar warning may be invoked. Too rapid elimination of edema fluid in the syphilitic type of heart disease and rheumatic valvular cases sometimes shows more temporary and less serious effects. On the other hand, one may disagree with certain of his suggestions of meeting this problem. One might question the rationale of subjecting all patients to "rest, digitalis and xanthine diuretics" before using the method of mercurial diuresis or the use of salyrgan. Secondly, his conclusions suggest the necessity of careful urologic study for obstructive uropathy and infection of the urinary tract. The type of patient that Dr Hines has described not uncommonly has a urologic situation masked by the heart failure syndrome. The question may be raised as to the relationship of this type of extracardiac disturbance to the cardiac insufficiency.

DR M. HERBERT BARKER, Chicago. This paper is of particular interest to me because in the cardiorenal vascular clinic

from 70 to 75 per cent of hypertensive vascular patients gradually acquire congestive heart failure. We have found it extremely important to dehydrate these patients slowly. The mild retention or moderate retention not only of urea but of other metabolites, particularly phosphorus and, as mentioned here, phenols and other toxic elements which become much more toxic as concentration is brought about by diuresis, makes it necessary that we do it slowly. I am sure that we have all seen one of the little brochures that show the wringing out of the sponge so quickly that we were quite impressed by this rather dramatic picture. However, a diuresis may be just about that dramatic, and it must be kept in mind that the kidney cannot always clear these waste products as fast as it does water. Sure enough, one may squeeze out the water but not so with the retained metabolites. According to my experience the result has been that one drives urea up, which may not in itself be especially toxic, but associated with it there is the concentration of these other waste products, particularly phosphorus, with a resultant severe acidosis and further progression of a uremic state and the patient slips rapidly into a state of coma. Caution, as Dr. Hines emphasizes, needs to be emphasized from time to time.

DR. LAURENCE E. HINES, Chicago. I am grateful for the discussion. I hope I did not give the impression that mercurial diuretics are harmful to all patients. This presentation is chiefly a plea for the use of drugs capable of producing minor diuresis in preference to those which produce marked diuresis. In connection with Dr. Maher's remark about the early use of salyrgan, I do not believe it should be used if minor diuresis can be effected by a simpler regimen. Dr. DeGraff asked about the incidence of hypertension. About half of the patients at the time we saw them had hypertension.

Clinical Notes, Suggestions and New Instruments

THE EFFECTS OF TOXIC DOSES OF BENZYL METHYL CARBINAMINE (BENZEDRINE) IN MAN

SIDNEY P. WALD, M.D., CHICAGO

Benzedrine is a synthetic drug which is in common use today and frequently is taken without medical supervision. The benzedrine inhaler has been used extensively in infections of the upper respiratory tract, benzedrine solution has been used locally less frequently in this condition. Benzedrine sulfate has been used internally with success in the treatment of narcolepsy and in cases of orthostatic hypotension. It is interesting to note that in my experiments toxic doses of benzedrine sulfate produce orthostatic hypotension constantly for several hours after the original stimulation of the sympathetic nervous system has subsided.

In the experimental study of the effects of toxic doses of benzyl methyl carbinamine by inhalation, it is a most difficult task to determine the amount of the drug absorbed and its manner of destruction and elimination in the human body. It is important to note that the toxic doses used in the experiments given here have no counterpart in clinical use. However, with therapeutic doses the majority of reported untoward symptoms compare closely with the constant symptoms noted with toxic doses of benzedrine. The subject used in these experiments was a normal man, aged 27, weighing 97 Kg. Eight separate experiments were carried out in all, each being from seven to ten days apart. In each experiment two new benzedrine inhalers were used simultaneously and were inhaled normally and at times deeply for periods of from four to six hours continuously. Exhalation was always done through the oral cavity. Each inhaler is reputed to contain from 0.305 to 0.360 Gm per tube, 0.325 Gm being accredited average. Benzedrine, being volatile, was negligible in the tubes at the conclusion of each experiment. It was calculated that approximately 650 mg. (10 grains) was

inhaled in each experiment (67 mg. per kilogram of body-weight). It is, of course, unlikely that all of the drug inhaled was absorbed. The estimated absorbed doses were believed to be approximately 400 to 500 mg. This was checked in one experiment by ingestion. This would be approximately fifty times the usual therapeutic dosage of benzedrine sulfate in mouth, it is approximately 1,000 times the usual therapeutic dosage of the inhaler—two inhalations an hour. The menthol in the inhalers is not absorbed, but it does produce a local pseudo-anesthesia of the nares. The oil of lavender is not absorbed and produces no known local effects. All symptoms and signs recorded were constant in all experiments unless otherwise stated.

It is known that therapeutic doses of both ephedrine and benzedrine produce different results both quantitatively and qualitatively in different individuals. However, ephedrine in toxic doses usually produces different quantitative changes in different individuals. This would appear to be true of benzedrine in toxic doses also. It would, of course, be advisable to have more data from several other cases to assure the present results, however, the experiments are quite harsh for voluntary help, and it would be absolutely unwise to use unknown patients.

The absorption of large quantities of benzedrine (approximately 650 mg.) by inhalation in one experiment caused a questionable paralysis of the sympathetic system, and the heart was controlled by the vagus system. This was a clinical observation. In my eight experiments the rise of blood pressure with the inhalation of benzedrine was constant and did not return to normal for ninety-six hours. However, at no time was albuminuria present. With toxic doses of benzedrine the great loss of appetite with resulting rapid loss of weight was due to the marked relaxation of the entire gastrointestinal tract. The water content of the body was greatly reduced. An increased metabolism was suspected but was not checked by laboratory methods. The physical activity, of necessity, was minimal. After the effects of the drug had disappeared the weight quickly returned to normal even though from 10 to 14 pounds (4.5 to 6.4 Kg.) had been lost on an average during the three to four day period following inhalation. With toxic doses of benzedrine the stimulation of the central nervous system remained for several hours after cessation of inhalation, but following this a marked mental depression and general fatigue was constantly present for from three to four days.

A definite tolerance of the body for benzedrine is slowly built up, and increasing doses are necessary to produce the original effects. The question of addiction to benzedrine is not settled, but I believe the possibility is not to be treated lightly, for most drugs that produce a pleasant effect on the brain (either stimulating or quieting in nature) have their addicts.

Toxic Signs and Symptoms Due to the Inhalation of Benzedrine

- | | |
|---------|---|
| Eyes | 1 Slight blurring on near vision |
| | 2 Dilatation of pupils with peculiar glaring appearance which remains for 6 to 12 hours after cessation of inhalation |
| | 3 Reaction to light and in accommodation sluggish |
| | 4 Slight conjunctival injection |
| Nose | 1 Loss of smell (immediate) |
| | 2 Pseudo anesthesia of nasal passages (menthol) |
| | 3 Numbness and coldness of nose |
| | 4 Extreme dryness of nose especially the post nares which lasts for 36 to 48 hours |
| | 5 Moderate amount of mucous secretion which starts about 12 hours after inhalation and lasts from 2 to 4 days |
| | 6 Occasional petechial hemorrhagic areas in nares |
| Ears | 1 Slight tinnitus toward end of inhalation |
| | 2 Moderate pounding in ears at end of inhalation |
| Mouth | 1 Marked dryness for 24 hours |
| | 2 Marked salivation in experiment 8 only |
| Pharynx | 1 Marked dryness for 24 hours |
| | 2 Extreme soreness of throat (three occasions) which lasted for 4 hours and was temporarily relieved by sodium bicarbonate R ₂ |
| | 3 Moderate redness of pharynx |
| | 4 Postnasal drip present for 24 hours |
| Lungs | 1 Marked emphysema for 24 hours |
| | 2 Many moist rales for 24 hours which clear with coughing |
| | 3 Whitish foamy sputum for 24 hours |
| | 4 Moderate dyspnea on exertion (72 hours) |
| | 5 Cyanosis absent |

Review of the literature has been omitted from THE JOURNAL but will appear in the reprints.

Heart

- 1 Unable to percuss borders for 6 to 8 hours after inhalation
- 2 Heart beat forceful but barely palpable
- 3 Many extrasystoles for 4 to 5 days
- 4 Paroxysmal tachycardia on two occasions after cessation of inhalation
- 5 Murmurs absent
- 6 Rhythm of heart unstable and sinus arrhythmia present
- 7 Tachycardia producing marked tachycardia Moderate tachycardia at rest for two days
- 8 Aortic second tone markedly accentuated and ringing was noticed on two occasions
- 9 Pulmonary second tone moderately accentuated for few hours
- 10 Bradycardia on one occasion at end of inhalation (irregular rhythm)
- 11 Rate 96 to 120 during inhalation 80 to 90 for 4 to 5 days at rest (normal 72 to 76)
- 12 Orthostatic hypotension for 24 hours after cessation of stimulation

Gastro Intestinal

- 1 Extreme loss of appetite for 48 to 60 hours
- 2 Appetite extreme after 4 days
- 3 Loss of weight 10 to 14 pounds which was regained in a week
- 4 Belching moderate for 2 days
- 5 Flatulence extreme for 60 hours
- 6 Abdominal distention marked for 48 hours
- 7 Slight general abdominal discomfort in 2 to 3 hours after cessation of inhalation
- 8 Occasional pain referred to precordium and disappeared with passage of flatus
- 9 Constipation 4 to 5 days
- 10 Diarrhea without colic (one occasion)
- 11 On two occasions typical pyloric spasms present which were relieved in 15 to 20 seconds by alkali Occurred 48 hours after cessation of inhalation
- 12 Peristalsis decreased for 24 hours
- 13 No nausea or vomiting

Genito Urinary

- 1 Marked shrinkage of mucous membrane of external urethra
- 2 Immediate diuresis (2000 cc on one occasion Usually 500 to 1000 cc) in 4 to 6 hours
- 3 Moderate suppression of urine after 8 hours for 24 hours
- 4 Decreased control of sphincter urethrae both in starting and stopping stream
- 5 Call to urination not present till marked bladder distention
- 6 Markedly decreased force of stream
- 7 Thirst absent in all experiments

Skin

- 1 Marked coldness of extremities for 24 hours
- 2 Blanching of extremities with marked flushing of face and neck for 24 to 48 hours
- 3 Small erythematous patches around neck and shoulders
- 4 Marked tingling of skin especially in extremities during test and for several hours following
- 5 Slight decrease in sensation of extremities for several hours
- 6 Transitory chilly sensations in different areas of body for 24 to 48 hours
- 7 Generalized flushing of skin after 12 hours for 12 to 24 hours
- 8 Perspiration diffuse during inhalation Peculiar odor present On occasion perspiration continued for 4 to 6 hours after cessation of inhalation

Vessels

- 1 Marked visible and palpable pulsations of all superficial arteries (including radial at wrist and dorsal pedis)
- 2 Bounding pulse at rest
- 3 Weak and thready pulse with exertion
- 4 Increase of size of superficial veins

Brain

- 1 Numbness of brain at end of inhalation
- 2 Attacks of cerebral anemia on assuming erect position for 24 hours (Cause splanchnic dilatation with inefficient cardiac response)
- 3 Increased mental activity during inhalation with decrease in mental efficiency
- 4 Decrease in memory for 2 to 3 days
- 5 Moderate euphoria during inhalation
- 6 Marked insomnia for 48 to 72 hours
- 7 Secondary mental depression for several days
- 8 Moderate general weakness and fatigue for several days
- 9 Increased libido during and for short period following inhalation
- 10 Decreased libido from two hours to four days following inhalation

Extremities

- 1 Coarse tremor of hands for 24 hours
- 2 On several occasions blanched areas accompanied by moderate pain were present Heat gave relief
- 3 Pains in the muscles of the lower extremities 4 to 6 hours after inhalation on two occasions (experiments 7 and 8)
- 4 Toxic papular erythema on extremities for 36 hours (experiment 9)
- 5 Mottling of the skin especially noticeable in the hands for 24 to 36 hours
- 6 Moderately increased reflexes for 24 hours

Laboratory Examinations

Urine

- Specific gravity 1.002 to 1.005 first specimen
1.008 to 1.012 second specimen
1.018 to 1.036 third specimen
- Albumin not present in any specimens
Sugar not present in any specimens
Casts not present in any specimens
Red blood cells not present
Few white blood cells occasionally

Stool

- No pathologic changes except extreme constipation

Electrocardiogram

- Normal before and after inhalations
Slight sinus tachycardia 2 days after 1st inhalation

Blood Pressure (Average)

- Before inhalation 118/80
At end of inhalation 175/102
After two days 145/95
After four days 120/84

CONCLUSIONS

1 Continuous inhalation of benzedrine can produce definite toxic effects characteristic of sympathomimetic excitation, stimulation of the central nervous system and depression of the cardiac muscle

2 Ephedrine and benzedrine are pharmacologically very similar in toxic doses

3 Benzedrine in toxic doses reduces libido moderately after sympathetic stimulation subsides

4 The pressor effect of benzedrine is marked but relatively temporary

5 Benzedrine in toxic doses is a diuretic in normal individuals

6 The stimulation of the central nervous system is marked but relatively temporary and is always followed by marked fatigue and mental depression when toxic doses of benzedrine are absorbed

7 Permanent organic changes are probably negligible with normal doses of benzedrine over long periods of time

8 The margin of safety of benzedrine is great in normal persons

9 The likelihood of addiction is quite possible

10 The indiscriminate use of benzedrine is very unwise

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CANCER DESICCATION AND CHEMISTRY

EDWARD G. MARTIN, M.D., DETROIT
Attending Proctologist, Detroit Receiving Hospital

Heat used in the treatment of cancer was never satisfactorily effective until the introduction of the modern diathermy machine. There is now available for desiccation purposes 3,500 (°) degrees of controlled heat. It is of historical interest to note that Hippocrates used hot irons in the treatment of cancer of the breast 2,000 years ago. Percy's work with the cautery is of contributory value, so was Crookall's¹ work with diathermy, reported in 1926. Strauss and his associates² appear to have taken the use of "surgical diathermy" more seriously and report several years of favorable and interesting experience.

FIRST CLINICAL THIRTEEN YEAR CURE

In June 1935 I³ reported (case 1) my first clinical cure of advanced cancer of the rectum, this patient had a liver metastasis. His major treatment by fulguration or desiccation was in May 1934, the second and last (minor) fulguration was in October 1934. After three years he still remains clinically free from any symptoms of cancer. Case 1 was reported as clinical evidence in support of my supposition that cancer is a slow individual reaction to an unidentified substance⁴—an allergy. I now add four consecutive cases of well advanced adenocarcinoma of the rectum that have been treated by radical desiccation. All five patients have been free from evidence or clinical symptoms of cancer from one to more than two years. The diagnosis in all five cases was clinically well advanced carcinoma, proved by expert microscopic study. These comprise all the private cases that were treated by radical desiccation, and all would be considered operable by most standards except case 1. My experience in clinic cases at Receiving Hospital, where cancer in the most advanced degree comprised most of them, was illuminating and the improvement observed was sufficiently encouraging to warrant the experimental trial in private cases of less advanced degree. Let me declare that I now have no hesitancy in desiccating a so called operable carcinoma situated entirely within the rectum and that I do so with an increasing confidence of producing a 'clinical recovery'. By 'clinical recovery' I mean just what that statement implies,

Read before the American Proctologic Society, Atlantic City, N. J. June 8, 1937

1 Crookall, A. C. Treatment of Cancer of Rectum by Percy Cautery and Endohermy. *Tr. Am. Proct. Soc.* 1925 Northwest Med. 25: 253 (May) 1926

2 Strauss, A. A. Strauss, S. F. Crawford, R. A. and Struss, H. A. Surgical Diathermy of Carcinoma of the Rectum. *J. A. M. A.* 104: 1480 (April 27) 1935

3 Martin, E. G. A Hypothesis as to the Etiology of Cancer. *Tr. Am. Proct. Soc.* 1935

4 Abrikosov, A. I. Morphologic Manifestations of Allergic Reactions in Man. *Soviet Jour.* 19: 619 1933

the entire disappearance of the growth with regeneration of mucous membrane disappearance of cachexia, gain in weight, and such general recovery in health the loss of which may have resulted from the malignant growth. Scar tissue, which may be a complication, has not occurred in any of these five cases.

Various conclusions will necessarily be drawn when a number of men apply different technics to widely divergent degrees of involvement. It must be realized that the majority of those using some form of heat application do not expect recovery, and those who have been courageous enough to mention it at all suggest it for palliation only in advanced cases. In spite of my optimism I am constrained to assert that desiccation is still experimental. More experience will develop a technical standard for the application of electrodesiccation, then a composite experience will be of greater value.

THE TECHNIC AND ITS DANGERS

Desiccation is a dangerous procedure requiring expert surgical and anatomic knowledge. One must have adequate exposure, preferably in the knee shoulder position with 50 mg of spinal anesthesia. Insulated equipment is desirable, as well as a sucker to remove the smoke. A high tension ark using the machine's capacity with a spark devoid of the flame developed in a number of the tube machines is important. A part of the procedure consists of cooking the tissue by deep insertion of an electrode, as well as fulgurating and desiccating it from the surface. "Cauterization" has no place in this procedure (I am not describing palliative treatment). Hemorrhage can be profuse and fatal, a perforated bowel and death may result when fulguration is done above the peritoneal reflection. It is a major radical surgical procedure to be used skilfully and with courage, if satisfactory results are to be anticipated. It is my intention to desiccate the entire growth whenever possible and to finish with a second and often final treatment in approximately two weeks. Examination should be made monthly and further desiccation administered as indicated by observation. Biopsies should be used to differentiate granulation tissue from cancer growth.

So much as has been related I believe can be substantiated in fact and in principle by the experience of a number of other investigators.

Such results as have been seen simply must arouse interest and speculation, even among the conservative. Local excision of malignant growths has been considered bad surgery for years, it has long been discarded because experience disclosed a prompt recurrence either locally or by metastasis in the great majority of cases. Modern surgical technic comprises the most radical procedure commensurate with reasonable safety because of the lymphatic spread—"everything to gain and very little to lose."

Desiccation seems to offer some hope of the development of a better method in treating cancer, when I stress a 'better method.' I do not refer to the desiccation treatment, actually its field of application is very limited. Something has to account for the remarkable results that have accrued by burning cancer tissue, it is not reasonable or intelligent to dismiss what one has seen with a 'wise crack' and assume a defeatist attitude that "cancer can't be cured."

It is common knowledge, at least among biochemists, that much chemistry is evolved when tissue is burned. It seems to me that among the chemicals resulting from desiccation and fulguration of cancer is one or a combination of several that influences metastasis. It is known that heat of a reasonably mild degree destroys cancer cells, which can account for a local disappearance. The intense heat that I have used penetrates deeply, more deeply I believe than radium, yet that does not account for an effect on the more distant metastases. It could be and may be a chemical action or desensitization, and if so it can and will be proved by its recovery in solution. Its recovery affords the possibility, if not the probability, of identification. Further possibilities then become unlimited.

I have made a filtrate from desiccated cancer tissue but have progressed as yet to no reportable conclusion. There is no reason to believe that the chemistry must result from fulgurated cancer tissue, any tissue, such as placenta, should do.

The question has been properly asked, If chemistry is a recovery factor why do not advanced cases exhibit more uniform improvement? If chemicals are a determining factor, an

insufficient quantity is developed by the limited desiccation to overwhelm extensive involvement. The question as to whether cancer of the bladder does not respond more uniformly to fulguration may be answered by the fact that fulguration is limited by the fear of puncture and therefore very little chemical reaction could be expected.

I have the greatest admiration for the remarkable progress made in modern surgical procedures dealing with cancer, however, I shall have a much greater admiration for any method that will cure cancer without surgery. It may be possible—who knows?

1447 David Whitney Building

ENCEPHALOPATHY FROM THE THERAPEUTIC USE OF LEAD AND OPIUM PILLS

WILLIAM R. GERAGHTY, M.D., BALTIMORE

Because of the small dose and short period of administration, it is unusual to have toxicity from an ingested medicinal soluble lead salt. Rarely has the intoxication been of the encephalopathic type. Nevertheless a small dose, long continued, may produce encephalopathy, as is shown in the following report.

REPORT OF CASE

History—G. G., a man, aged 43, admitted to the neurological service of St. Joseph's Hospital Jan. 25, 1937, complained of headache, mental confusion, muscular weakness and epileptiform convulsions. The family history was unessential. He had active pulmonary tuberculosis complicated by intestinal tuberculosis, necessitating the removal of 12 inches (30 cm.) of terminal ileum, the cecum and ascending colon on June 10, 1936. After this diarrhea developed, for which, beginning August 29, he took a pill containing 1 grain (0.065 Gm.) each of lead acetate and opium, twice a day. Except for one seven day period, this was continued until Jan. 19, 1937. The onset of the present illness was indefinite. Tremor of the right side of the face, pallor of the skin, muscular weakness and loss of weight were noticed about December 25. After a temporary loss of consciousness Jan. 17, 1937, memory was greatly impaired and he was clouded, confused and disoriented. Amblyopia and continuous right frontal headache both became troublesome. January 24, after two generalized convulsions, he was delirious and had to be restrained.

Examination—The temperature, pulse and respiration were normal and remained so throughout. Blood pressure was 120 systolic, 60 diastolic. He was obfuscated, irrational and reluctant of examination. There was marked pallor of the skin and mucous membranes and a lead line on the gingiva of four carious lower incisor teeth. Both optic disks were pale and the retinal veins full. An old choroidoretinitis with exudate was present on the right. The left upper and lower cutaneous abdominal reflexes were absent. All deep tendon reflexes were exaggerated. A fine tremor was present in both arms. The left leg was weak and both feet and ankles were edematous.

Examination of the blood revealed red cells 2,550,000, hemoglobin 46 per cent, white cells 15,750, polymorphonuclears 89 per cent, lymphocytes 16 per cent, mononuclears 2 per cent, eosinophils 2 per cent. Stippled cells averaged 26,000 per million red cells. Anisocytosis, with macrocytes predominant, and poikilocytosis were present. The blood was of group A. The Wassermann reaction was negative. Blood chemistry revealed nonprotein nitrogen 0.35 mg. per hundred cubic centimeters, and sugar 0.7 mg. January 27 the lead content was 0.37 mg. per hundred grams of blood. The spinal fluid under a pressure of 16 mm. of mercury, was clear and contained 4 mononuclear cells per cubic millimeter and a trace of globulin. The Wassermann reaction was negative. The lead content was 0.042 mg. per hundred grams of fluid. Urinalysis revealed an acid reaction, specific gravity of 1.014 and no albumin or sugar. The lead content was 0.39 mg. per liter of urine.

Roentgenograms showed faint lead deposits in the epiphysis of the radius, ulna and tibia.

1 The Baltimore City Health Department made the examination for lead using the diethylthiocarbazon (Dithizone) technic.

Therapy—Fifteen grains (1 Gm) of calcium chloride intravenously twice a day and 15 grains (1 Gm) of calcium gluconate by mouth, three times a day, was continued until March 28. In addition he was given iron and ammonium citrate, 30 grains (2 Gm) three times a day. Parenteral liver therapy for two weeks made no appreciable increase in the red blood cells.

Course—Convulsive seizures, from one to four each day, persisted until January 29, however, he was irrational and required restraint until February 3. He frequently vomited dark bile stained fluid, was incontinent and often refused medication. Headache continued throughout February. February 22 the stipple cell count was 19,000 per million red cells. March 3 the feces contained 0.23 mg of lead per hundred grams and 0.12 mg per gram of fecal ash. March 15 the saliva contained 0.015 mg of lead per hundred grams. March 25 the blood examination showed red cells 3,560,000, hemoglobin 82 per cent, white cells 9,250, polymorphonuclears 60 per cent, lymphocytes 24 per cent, mononuclears 12 per cent, myelocytes 4 per cent. Anisocytosis and poikilocytosis were less marked. The lead content of the blood was 0.15 mg per hundred grams. Blood calcium was 9.9 mg per hundred cubic centimeters of serum. Three tenths cubic centimeter of sweat contained 0.0004 Gm of lead. March 29 the spinal fluid, under a pressure of 8 mm of mercury, contained 2 mononuclear cells per cubic millimeter and was globulin free.

Diarrhea, from five to eight stools a day, did not retard improvement, and a gain of 16 pounds (7.3 Kg) was made by April 1.

The patient was discharged April 3 without evident mental aberration and free from tremor but with slight general muscular weakness.

In the follow-up record April 22 the blood examination revealed red cells 4,950,000, hemoglobin 80 per cent, white cells 10,650, polymorphonuclears 87 per cent, lymphocytes 12 per cent, mononuclears 1 per cent. There was a moderate degree of anisocytosis and poikilocytosis. Stipple cells averaged 1,000 per million red cells. The reticulocyte count was 2.95 per cent. Blood calcium was 12.8 mg per hundred cubic centimeters of serum. The lead was 0.11 mg per hundred grams of blood. The neurologic signs were essentially negative. At the time he had a headache. The changes in the right fundus were unaltered. The lead line was less prominent. June 25 the lead was 0.092 mg per hundred grams of blood.

COMMENT

The general health of this patient was previously depleted by advanced tuberculosis, which it is believed predisposed to the plumbism. He was admitted with the provisional diagnosis of tuberculoma of the brain, it was two days later that lead encephalopathy was determined. The total ingestion of lead acetate was 274 grains (17.75 Gm) in less than five months. There is no parallel between this amount and that actually absorbed from the alimentary canal. Nor is it possible to fix a time when toxicosis really began—before the lead content of the body fluids reached the high level present on admission.

A previous resection excluded the terminal ileum and part of the colon from participation in either the absorption or the elimination of the lead.

It is to be remarked that the spinal fluid did not show a pleocytosis, but the pressure of 16 mm of mercury on admission must be considered high when compared with an 8 mm pressure two months later.

In the lead fixation therapy there were no manifest deleterious effects from the intravenous use of the calcium chloride. Lead in the blood stream was reduced approximately 33 per cent in four weeks and 60 per cent in two months. In the lead estimations the whole blood was used for testing.

Obviously it is important that no effort be made to delead this man and every effort be made to reduce the lead in the circulating blood stream by maintaining a positive calcium balance.

CONCLUSION

Ingested lead acetate, in small doses over a long period, can produce encephalopathy.

10 East Biddle Street

Council on Pharmacy and Chemistry

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT
PAUL NICHOLAS LEECH Secretary

CREOSOTE AND GUAIACOL COMPOUNDS OMITTED FROM N N R

For some years the Council has considered the lack of evidence for the usefulness of creosote and guaiacol preparations administered orally for their supposed action on the respiratory passages. The products Calcreose (Maltbie Chemical Co.), Creosotal-Winthrop, Benzozol, Duotal (Winthrop Chemical Co.), Proposote (Parke, Davis & Co.) and Thiocol-Roche, fall into this classification, three of them—Calcreose, Duotal and Thiocol-Roche—were included in the first edition of New and Nonofficial Remedies in 1907 and the others were accepted at various times up to 1925. Guaiacol Sulphonate-Merck, included in the accepted but not described section of N N R, also comes under this consideration. The acceptance of these products was based mainly on the ground that the claims for their efficacy were in harmony with generally accepted opinion and their acceptance was continued because they were reconsidered mainly with reference to claims previously made and not at the time questioned by most pharmacologists and clinicians.

I PHARMACOLOGIC STATUS

The present views of the leading pharmacologists are expressed in closely similar terms in the textbooks of Cushny, Meyer and Gottlieb, and Solimann. The latter states:

Uses—Creosote and guaiacol were extensively employed in tuberculosis, having been introduced especially by Sommerbrodt in 1887 but they have gone out of fashion since the clinical benefits did not prove sufficiently definite, and the laboratory results were quite negative.

With reference to other claimed effects—promoting appetite and digestion, lessening cough, and so on—Solimann (*A Manual of Pharmacology*, ed 5, p 617) states:

It would be still more difficult to explain the effects. The tubercle bacilli are certainly not killed in their foci, it is doubtful whether their growth is restrained. Thiocol is potassium guaiacosulphonate analogous to sodium phenolsulphonate. Like the latter, it has very little effect.

II CURRENT LITERATURE

The Council has given consideration to the current literature, which affords no satisfactory evidence for the usefulness of these preparations. In this connection it is interesting to note that Clark and Kirch (*J Am Pharm A* 24 564 [July] 1935) state that "Search of the available literature reveals no records of painstaking pharmacological work on this substance [potassium guaiacol sulfonate]."

Other articles were considered by the Council but only one of them seems to suggest that these compounds are of definite therapeutic value in the conditions for which they are commonly used. It is difficult to evaluate the part played by guaiacol carbonate in the results reported by R. Burnand (Guerison clinique controlee apres six annees d'une tuberculose intestinale ulcereuse inoperable, *Bull et mem Soc med d hop de Paris* 54 875 [May 26] 1930), since he used various other measures in addition to the guaiacol compounds.

Consideration was also given to three manuscripts submitted by Professor Livingston of Temple University. These consisted of studies conducted by Edwin J. Fellows, under a grant from Maltbie Chemical Company, manufacturer of Calcreose, they were I Calcium Creosotate Chemistry, II Calcium Creosotate Bacteriology, III Calcium Creosotate Elimination. It is the opinion of the Council that not one of these studies affords evidence of the therapeutic value of Calcreose. These papers have been published in the *Journal of Pharmacology and Experimental Therapeutics* 57 122 (June) 1936, 60 178, 183 (June) 1937, under the title "Studies on Calcium Creosotate."

Among other articles cited by Hoffmann La-Roche, Inc., manufacturer of Thiocol-Roche, was the thesis of Pierre Fehvre. A letter was addressed to the Laboratories of Chemistry and Physiology of the School of Medicine and Pharmacy of Clermont France, requesting a copy and the Council, after giving it due consideration came to the conclusion that it contained nothing that bears directly on the rationale for the clinical use of the Hoffmann La-Roche product.

After reviewing the cited references, as well as others, including those submitted by the manufacturers, the Council decided that they afford no satisfactory evidence that these products have any important effect. It is indeed strange that drugs which are used as extensively as claimed by the manufacturers would have so little back of them in the literature, this is especially true of products that are far from new.

III. CLINICAL EFFICACY

The Council, anxious to give thorough consideration to all phases of the matter, decided to obtain the opinions of certain members of the medical profession as to the efficacy of these products.

The following information was derived entirely from the replies to inquiries sent to the active membership of the Association of American Physicians and the American Pediatric Society (see end of report). To the 286 inquiries made, 180 replies were received, however, fourteen of the physicians who replied were not in practice and hence had no occasion to prescribe these remedies. Of exceeding interest was the fact that only three of the remaining 166 stated that they used the preparations frequently, while 108 have not used them at all in recent years. The remaining fifty-five use them occasionally or rarely. That some physicians would still be using one or more of them is not surprising in view of the fact that these preparations have been used to some extent in the past and are being constantly advertised to the medical profession. It must be remembered in considering these figures that these drugs are recommended in conditions that would call for frequent use if they were considered to be of unquestioned benefit, since there are so many patients in the class for which these substances are said to be employed.

Further consideration of these replies indicates that not one of the 166 members had any knowledge of a "blind test" of these substances and that most of them merely reported their impressions. Furthermore, many of those who occasionally use these substances expressed some doubt of their being worth retaining, or at least made no attempt to justify their inclusion in N. N. R. This is taken as an indication that these agents were used for the most part empirically. Only three or four of the members of these two organizations made any sort of vigorous defense of the preparations and these were based on clinical impressions rather than on exact knowledge of their mode of action.

IV. OTHER CONSIDERATIONS

While the Council had this matter under advisement, the A. M. A. Chemical Laboratory undertook to evaluate better standards for New and Nonofficial Remedies for potassium guaiacol sulfonate. The Heyden Chemical Company wished to submit its product Potassium Guaiacol Sulphonate but as a result of preliminary discussion with the A. M. A. Chemical Laboratory on the matter of standards, the product was never formally presented to the Council. The Laboratory could not confirm either the revised tests and standards submitted by Heyden Chemical Corporation or those of Hoffmann La-Roche, Inc. Notice to this effect was sent to the two firms. Hoffmann La-Roche, Inc., replied that it would take up the matter with its principals in Switzerland, no further reply has been received from this firm. The Heyden Chemical Corporation in reply to a follow-up letter called attention to the fact that the National Formulary had published a galley proof of a proposed monograph and that its product met National Formulary requirements. In reply the A. M. A. Chemical Laboratory pointed out that the assay method given in the proposed National Formulary monograph was not workable.

In view of the foregoing considerations the Council voted that all manufacturers of accepted creosote and guaiacol preparations be informed that after the expiration of the longest period for which any one of them stood accepted (one year from date), no compound of this type would be reaccepted or accepted for N. N. R. without convincing evidence of the therapeutic value claimed. The Council's secretary forwarded this decision to all firms whose products of this class are now in N. N. R.—the Maltbie Chemical Company, the Winthrop Chemical Company, Inc., Parke, Davis & Company, and Hoffmann La-Roche, Inc.—with the suggestion that in the meantime they might care to submit further evidence for the therapeutic value of these products.

The Maltbie Chemical Company replied that it had established a three year fellowship, which resulted in the three articles by Fellows already mentioned. A second reply from Maltbie Chemical Company noted that it had initiated studies to demonstrate the therapeutic usefulness of Calcreose.

The Winthrop Chemical Company presented no evidence bearing on the question at issue.

Parke, Davis & Company stated that it believed the compounds were useful but that it was not promoting any products of this description and hence was not interested in undertaking the accumulation of clinical evidence.

Hoffmann La-Roche, Inc., replied submitting certain references, including the one noted by Pierre Febvre and others to which the Council has given consideration. This firm also noted that it was evident that the therapeutic action of their particular product [potassium guaiacol sulfonate] has not and probably cannot, be explained satisfactorily on a laboratory basis but that clinical observations speak of definite beneficial effects produced by such preparations.

The Council has taken full cognizance of the fact that the Maltbie Chemical Company instituted experimental and pharmacologic studies and is planning actual clinical tests but at the same time notes that other firms are not sufficiently interested in the products to take similar action, nor have they submitted anything in their correspondence with the Council which would warrant the Council's giving further consideration to the matter.

V. SUMMARY

1 Reference to reliable textbooks of pharmacology and therapeutics does not indicate the therapeutic value of these preparations.

2 The current literature has nothing to offer that changes the opinions expressed in these textbooks.

3 A survey of clinical experience with the drugs indicates that they are little used by leaders in the profession and that their rationale is little understood by those who do employ them.

4 Consideration of other matters, including the attempts of the A. M. A. Chemical Laboratory to set adequate standards, and the communications with the manufacturers have not produced up to the present any significant evidence of the value of these preparations.

5 In conclusion the Council wishes to note that consideration of evidence in the pharmacologic and medical literature, past and present, as well as a survey of clinical opinion and manufacturers' special pleadings do not indicate that this group of drugs is a necessary part of a modern therapeutic armamentarium.

The Council therefore voted that Calcreose, Calcreose Tablets, 4 grains, Compound Syrup of Calcreose, and Solution Calcreose, sold by the Maltbie Chemical Company, Benzosol, sold by the Winthrop, Duotal and Duotal Tablets, 5 grains, sold by the Winthrop Chemical Company, Inc., Proposote, Proposote Capsules, 5 minims, and Proposote Capsules, 10 minims, sold by Parke, Davis & Co., Thiocol-Roche, Syrup Thiocol-Roche, and Thiocol-Roche Tablets, 5 grains, and Guaiacol Sulphonate Merck be omitted from New and Nonofficial Remedies because they are marketed without satisfactory evidence that they have sufficient therapeutic value to justify their retention in N. N. R. In the event of the appearance of evidence of the therapeutic value of this group of compounds, the Council will give it consideration.

The following are the letter and questionnaire referred to earlier as sent to the members of the Association of American Physicians and the American Pediatric Society.

"The Council on Pharmacy and Chemistry has under consideration the question whether or not acceptance of certain guaiacol and creosote preparations for oral administration should be continued in New and Nonofficial Remedies. The preparations are the following:

Calcreose (calcium creosotate)
Creosotal (creosote carbonate)
Benzosol (guaiacol benzoate)
Duotal (guaiacol carbonate)
Proposote (creosote phenylpropionate)
Thiocol (potassium guaiacolsulfonate)

"Examination of the literature within the last ten years failed to indicate any carefully controlled evidence of the value of these preparations. On the other hand, there are numerous

who continue to use these preparations. In order that the Council may be in better position to make a decision, it has authorized that a questionnaire be sent to members of the Association of American Physicians and the American Pediatric Society.

"It will be appreciated therefore if you will kindly answer the questions contained on the enclosed postcard and sign your name. We shall be glad to have you expand your remarks in a letter if you feel so inclined. As is usual with such requests of the Council, your name will not be used."

The postcard questionnaire

- 1 Do you prescribe preparations of guaiacol and creosote for internal use? Often? Occasionally? Rarely? Never?
- 2 If so for what purposes do you prescribe them?
- 3 Have you any convincing evidence that they are really effective in these conditions?
- 4 Have you conducted any blind test of these substances or do you know of any such blind tests?
- 5 Has your use of these substances increased or decreased?
- 6 Further remarks

Council on Foods

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED

FRANKLIN C. BING, Secretary

CELLU THOMPSON SEEDLESS GRAPES PACKED IN WATER

Distributor—The Chicago Dietetic Supply House, Inc., Chicago

Packer—Hunt Brothers, San Francisco

Description—Canned cooked Thompson Seedless Grapes packed in water without added sugar or salt

Manufacture—Selected Thompson Seedless Grapes from the San Joaquin Valley, Calif. are stemmed by hand, sorted for size (only the largest size is used in this pack), washed and placed in the cans by hand. The cans are weighed, filled with water, heated for six minutes at 91 C., sealed and processed at 100 C. for nineteen minutes. A sulfur dust or liquid is applied prior to or during the blossoming period.

Analysis (submitted by manufacturer)—Moisture 88.5%, total solids 11.5%, ash 0.2%, fat (ether extract) 0.7%, protein (N \times 6.25) 0.4%, invert sugar 9.8%, sucrose 0.05%, crude fiber 0.16%, carbohydrates other than crude fiber (by difference) 10.0%.

Calories—0.48 per gram, 14 per ounce

ARTISANA DISTILLED WATER

Manufacturer—Artisana Water Company, Phoenix, Ariz.

Description—Distilled water practically free of micro organisms

Manufacture—Water issuing at a constant temperature of 23 C. from an artesian well 392 feet deep, encased its entire length with standard screw type steel casing, is pumped through a closed system into hydropneumatic tanks and automatically fed into the boiler of a still having a capacity of 30 gallons per hour. The well water is distilled, passed through copper pipes to a copper reservoir, and immediately filled into clean five gallon glass bottles. The cork and bottle neck are covered with a dust-proof paper cap. All water so bottled is delivered within twenty-four hours. The boiler is thoroughly cleaned each day before firing. The first run of from 15 to 20 gallons of water is discarded.

Analysis (submitted by manufacturer)—*Sanitary analysis* sediment none, turbidity none, odor none, color none, total solids 40 *Parts per million*. Nitrogen as free ammonia 0.08, total organic 0.31, nitrites 0.000, nitrates 0.000, oxygen consumed 0.000, total chlorine 0.000, hardness (soap method) 2.0.

Micro Organisms (data submitted by manufacturer)—Total bacteria per cubic centimeter at 20 C. less than 1 at 37 C. less than 1. No evidence of the presence of organisms of the B. coli group.

- (1) FARMFRESH EVAPORATED MILK
- (2) RIECK'S PRIVATE BRAND EVAPORATED MILK

Manufacturer—Rieck-McJunkin Dairy Company, Pittsburgh
Description—Unsweetened, sterilized, evaporated milk

Manufacture—Milk from company and government inspected farms is tested, preheated, evaporated under vacuum, homogenized, cooled, again filtered, filled into cans, sealed and sterilized.

Analysis (submitted by manufacturer)—Moisture 73.6%, total solids 26.4%, ash 1.6%, fat (ether extract) 7.8%, protein (N \times 6.38) 6.8%, lactose (by difference) 10.2%, acidity 0.35%.

Calories—1.4 per gram, 40 ounce

GERBER'S STRAINED APRICOT AND APPLE SAUCE

Manufacturer—Gerber Products Company, Fremont, Mich.

Description—Canned sieved mixture of peeled cooked apricots and unpeeled cooked apples, slightly sweetened.

Manufacture—Selected fully ripened apricots are sorted, peeled, pitted, steamed, packed into cans and heat processed. Apples are cleaned by washing in diluted hydrochloric acid and rinsing thoroughly in water. They are then sorted, cored and steamed. Formula proportions of the canned apricots and the steamed apples are mixed, sieved, slightly sweetened to maintain uniform sweetness, filled into cans, sealed and heat processed.

Analysis (submitted by manufacturer)—Moisture 82.5%, total solids 17.5%, ash 0.5%, fat (ether extract) 0.2%, protein (N \times 6.25) 0.5%, crude fiber 0.4%, carbohydrates other than crude fiber (by difference) 16.0%, calcium (Ca) 0.009%, phosphorus (P) 0.016%, iron (Fe) 0.0014%, titratable acidity (expressed in terms of citric acid) 0.65 Gm. per hundred grams.

Calories—0.7 per gram, 20 per ounce

Vitamins—Feeding tests have shown that this product is an excellent source of vitamin A and contains significant amounts of vitamin B₁.

CELLU BRAND KADOTA FIGS PACKED IN WATER

Distributor—The Chicago Dietetic Supply House, Inc., Chicago

Packer—Kings County Packing Company, Armonk, Calif.

Description—Canned cooked Kadota figs packed in water without added sugar or salt.

Manufacture—Uniform Kadota figs are sorted, washed, placed in cans and covered with water. The cans are heated to 88 C., sealed and processed for sixty minutes at 100 C. Trees are sprayed before the leaves or fruit appear.

Analysis (submitted by manufacturer)—Moisture 87.5%, total solids 12.5%, ash 0.4%, fat (ether extract) 0.05%, protein (N \times 6.25) 0.5%, invert sugar 8.8%, sucrose 0.7%, crude fiber 0.75%, carbohydrates other than crude fiber (by difference) 10.8%.

Calories—0.46 per gram, 13 per ounce

SOUTHERN MAID OLEOMARGARINE

Manufacturer—The Cudahy Packing Company, Chicago

Description—Margarine prepared from refined hydrogenated deodorized cottonseed oil, salt, pasteurized cultured skim milk and an emulsifying agent, a derivative of glycerin. Contains 0.1 per cent of sodium benzoate.

Manufacture—Refined hydrogenated deodorized cottonseed oil is warmed and churned with pasteurized cultured skim milk, salt and a derivative of glycerin. Sodium benzoate is added. The resulting emulsion is solidified by contact with ice cold water, refrigerated, automatically molded, wrapped and packed in cartons.

Analysis (submitted by manufacturer)—Moisture 15.0%, total solids 85.0%, ash 2.7%, sodium chloride (NaCl) 2.6%, fat (ether extract) 81.4%, protein (N \times 6.25) 0.4% and carbohydrates (by difference) 0.5%.

Calories—7.36 per gram, 209 per ounce

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SATURDAY, JANUARY 15, 1938

MEDICAL CARE FOR ALL THE PEOPLE

Under the leadership of many county medical societies, with the approval of the state medical societies and in accordance with the actions of the House of Delegates of the American Medical Association, definite provisions for medical service to the indigent and to those partially able to pay have already been established in various parts of the country. Hundreds of such plans have been reported to the Bureau of Medical Economics of the American Medical Association and many of them have been described from time to time in considerable detail in the Organization Section of THE JOURNAL. In the state of Pennsylvania seventeen counties now have such plans actively in effect. In the state of Iowa many county medical societies have taken over completely the medical care of the indigent. In Kansas, in California, in Michigan, in Missouri and in many other states, plans already functioning seem to have solved to a large degree the question of preventive medicine and medical care for the people covered by these plans.

At its annual session in June 1937 the American Medical Association reaffirmed its willingness to do its utmost today, as in the past, to provide adequate medical service for those unable to pay either in whole or in part for medical care. At that time the American Medical Association also officially reaffirmed its willingness, on receipt of direct request, to cooperate with any governmental or other qualified agency and to make available the information, observations and results of investigations together with any facilities of the Association. The Social Security Board, the United States Public Health Service, the bureau devoted to maternal and child welfare in the Department of Labor, and many other government bureaus, commissions and agencies are known to be engaged in studies of health services which may yield information of importance in planning for the future. Thus far no call has come from any governmental agency for the cooperation of the American Medical Association in studying the need

of all or of any groups of people for medical service, or to determine to what extent any considerable proportion of our public are suffering from lack of medical care.

At the meeting of the American Public Health Association, held a few months ago in New York City, an address was made by Miss Josephine Roche, third assistant secretary of the treasury and in charge of the United States Public Health Service, in which she emphasized to that organization the importance of determining and meeting as soon as possible the actual needs of the indigent and of those partially indigent in relationship to medical care. Moved perhaps by her appeal, the American Public Health Association appointed a committee to confer with the Board of Trustees and the officers of the American Medical Association with a view to stimulating medical organizations everywhere toward greater activity in this matter. That committee met with the Executive Committee of the Board of Trustees of the American Medical Association in Chicago late in December. As a result of that conference the following resolutions were adopted by the Board of Trustees:

WHEREAS, A varying number of people may at times be insufficiently supplied with needed medical service for the maintenance of health and the prevention of disease, and

WHEREAS, The means of supplying medical service differ in various communities, be it

Resolved, That the American Medical Association stimulate the state and county medical societies to assume leadership securing cooperation of state and local health agencies, hospital authorities, the dental, nursing and correlated professions, welfare agencies and community chests in determining for each county in the United States the prevailing need for medical and preventive medical service where such may be insufficient or unavailable, and that such state and county medical societies develop for each county the preferable procedure for supplying these several needs, utilizing to the fullest extent medical and health agencies now available, in accordance with the established policies of the American Medical Association. Be it further

Resolved, That the Board of Trustees of the American Medical Association establish a committee to cooperate with the Bureau of Medical Economics in outlining the necessary procedures for making further studies and reports of the prevailing need for medical and preventive medical services, and that the Secretary of the American Medical Association arrange to develop such activities through the secretaries of state and county medical societies in each instance, urging the formation of special committees in each county and state where committees are not available for this purpose.

The undertaking proposed by this resolution is an attempt to apply on a nation-wide scale the best feature of the numerous plans already in effect, utilizing in each county to the fullest extent the resources there available. Thereby it becomes possible for the organization to act specifically as a clearing house in the initiation, development and functioning of what may well evolve into a comprehensive system of medical care for all the people according to the American plan of medical practice.

THE COMMONWEALTH FUND

In 1918 Mrs Stephen V Harkness gave \$10,000,000 to establish the Commonwealth Fund. Subsequent donations have increased the endowment to a total of about \$50,000,000, including \$8,000,000 recently given by Edward S Harkness, president of the Commonwealth Fund. These large sums have been dedicated to general philanthropic purposes without permanent restrictions. For the present, however, the income from \$3,000,000 of the recent gift will be used for the development of rural hospitals, and the income from the other \$5,000,000 for medical education and research.

The building of rural hospitals is not a new venture with the Commonwealth Fund, for it has already made possible ten hospitals in rural districts: two in Tennessee and one each in Maine, Ohio, Virginia, Kentucky, Mississippi, Oklahoma, Kansas and Utah. Eight of these are already in operation, another is nearing completion, and the tenth, in Provo, Utah, is still in the blueprint stage. The Commonwealth Fund plans to build one new rural community hospital annually.

A community hospital, as defined by the fund,¹ is one that serves the whole community regardless of race, color, creed or economic conditions. It is a place where the community provides for the care of its own sick by its own physicians and nurses, and it is owned by the people who expect to use it. While the doors of the community hospitals are open to all reputable physicians, the privilege of doing certain kinds of work, particularly major surgery, is to be earned only by adequate preparation. The community hospital puts a laboratory and an x-ray technician at the service of the physician and provides constant care for patients under a physician's direction. It also gives these physicians an organization through which relations can be maintained with consultants in large teaching centers.

The Commonwealth Fund has assisted in providing community hospitals in the belief they will attract well trained young physicians to these rural communities to practice. As a further means of helping in this movement, the fund has provided scholarships at Vanderbilt, Tulane and Tufts medical schools for young men who would agree to practice for a term of years in rural communities in Tennessee, Mississippi or Massachusetts. Eighteen young physicians are now established in practice under this plan, and fifty young physicians have settled in the vicinity of the first six community hospitals.

The type of young physician so trained is he who does his own blood counts, stool examinations, smears and urinalyses. He uses laboratories for cultures and Wassermann tests. He keeps within reasonable range of new methods of treatment and techniques but is cautious lest they involve risks which endanger his patient

and his reputation. These young physicians see all comers. They meet what the day brings. They lance boils, treat colds, make spinal punctures and perhaps type the pneumococci present in pneumonia patients. The community hospitals have well equipped fire-proof buildings of about fifty beds. They place an emphasis on good care of patients, careful records, staff discussion, graduate study and competent consultation.

The Commonwealth Fund has provided more than 400 fellowships for older physicians in practice who wish to brush up on recent advances. The older physicians have been enabled to study from one to four months at Harvard, Vanderbilt, Tulane and other medical schools. Assistance has been given at Tulane in financing a medical extension division which has made available neighborhood courses for physicians throughout the state of Mississippi.

The fund has aided medical schools in more general ways. It has aided in expanding the department of pediatrics at Tulane, has helped build facilities for teaching psychiatry as an element in general medicine at the University of Louisville and has helped to finance teaching clinics in which emotional and behavior problems are duly considered in the care of children's diseases at Cornell, Columbia and Harvard. The fund has provided fellowships for graduate study in psychiatry at the University of Colorado and at Johns Hopkins, and for special graduate training of psychiatrists at five child guidance clinics. However, after being actively interested in the establishment of child guidance clinics in the United States for years, the fund in 1927 ceased to give direct aid to such clinics generally, although it still shares part of the cost of the London Child Guidance Clinic in England and supports the educational work of the Child Guidance Council.

Among other endeavors, the Commonwealth Fund has encouraged research in medical schools and hospitals. In allocating the new income made available for this purpose, the fund will seek only research projects that promise to contribute to better medical practice. During the last year seven research undertakings were selected for subsidy in addition to a number carried forward from previous years. Among the seven research problems selected are the study of preeclampsia, eclampsia, the pernicious vomiting of pregnancy and the communicable infections associated with childbirth and abortion, at the New York University College of Medicine, a study of the nature of various infections of the central nervous system, of poliomyelitis, at Johns Hopkins School of Medicine, studies on clinical and immunologic phases of poliomyelitis at Harvard University Medical School, a comparative study of certain virus infections at Washington University School of Medicine at St. Louis, as a step toward better knowledge of the virus of trachoma, and the testing

¹ Summary of the Nineteenth Annual Report of the Commonwealth Fund for the Year Ending September 30, 1937.

of certain methods of treatment suggested from work already done on this virus. The fund has sponsored statistical and clinical studies of maternal mortality in New York and in two southern counties, has sponsored a study of disorders of pregnancy and childbirth at New York University, has helped finance extension courses in obstetrics for physicians in three states, has provided facilities for the safeguarding of childbirth in its rural hospitals, and has built up maternity nursing in rural health departments.

In the field of public health, the Commonwealth Fund believes that an especial current need is for technical experimentation to refine methods and gradually to raise standards. It is aiding, therefore, in experimental activities in Tennessee and Mississippi, where the state health departments have been strengthened by providing traveling units which advise local health departments and improve their methods of work. One county in each of these two states has been selected for a demonstration of adequate public health service, Sumner County in Tennessee and Jones County in Mississippi having begun demonstration programs during the last year. Four other counties where similar work had been done for several years have assumed responsibility for maintaining their health departments without further aid from the fund.

While much emphasis has been placed on activities in the field of health and medical education, other activities have received aid. In fact, the broad terms of this philanthropy make the income or principal applicable to any object which is considered "for the welfare of mankind."² Each year a portion of the income is reserved for grants to projects for which it assumes no administrative responsibility. Grants are occasionally made for other social, philanthropic and educational purposes.

There is a Legal Research Committee associated with the fund which sponsors studies in administrative law and the history of local concepts. It has aided in the completion of a five volume study of the Interstate Commerce Commission. The fund has a plan whereby a group of British students come to the United States each year for study and travel as guests of the fund. It provides for three fellows appointed from the Home Civil Service of the British government, and they come to the United States on leave of absence for a year from their government positions to study and observe. Thirty-one other fellows appointed from British universities or from the government service will spend two years in the United States and will travel widely during the coming summer.

Thus it appears that much wisdom and nobility of purpose have been manifest not only in the original conception of the Commonwealth Fund but likewise throughout the many years of its administration.

Current Comment

ANNUAL DUES NOW PAYABLE

Physicians who have not yet sent in their annual Fellowship and subscription dues for 1938 will find it convenient to utilize the colored slip in this issue of THE JOURNAL. Properly folded, it forms a safe, postage-prepaid envelop. All that is necessary is to make a few notations on the slip and mail with check, draft or money order. Note that along with THE JOURNAL are listed the subscription prices of the special journals published by the Association and also *Hygiene*, the Health Magazine. One order and one remittance can cover all subscriptions for the coming year. Fellows and subscribers who have already remitted will, of course, disregard the colored slip.

DON'T GAMBLE WITH GAMBLE

Recently several physicians have paid \$15 each for a listing of their names in an insurance medical directory, apparently they understood that they would be selected as medical examiners for certain insurance companies. This proposition was presented by one Mr. C. H. Gamble, representing the National Chiropractic Statistical Bureau with offices in New York City and Atlanta, Ga. In the event that one does not like the name of this organization, Mr. Gamble also represents the INSUROR INTERNATIONAL Association and the INSUROR Statistical Bureau with offices reported to be in Washington, D. C., Chicago, Memphis, Oakland, Calif., and Dallas, Texas. Letters mailed to several of these addresses were returned marked "Name not in city directory." Inquiries sent to the Better Business Bureaus in these cities also failed to locate any such organizations. Although Mr. Gamble uses a number of addresses in a great many cities, evidently his office is "under his hat." Physicians throughout the length and breadth of the United States have been visited by Mr. Gamble. From South Carolina to California, from Illinois to Louisiana, from Florida, Texas and Arizona have come complaints by physicians that the \$15 paid out resulted in absolutely nothing—not even a press proof of their names. Apparently, Mr. Gamble has been too busy traveling to work up the rest of his business. Twice during 1937 THE JOURNAL published articles on insurance medical directories,¹ pointing out the inadvisability of paying a fee for a listing in such directories. A resolution approved by the Judicial Council and adopted by the House of Delegates has condemned the listing of physicians in directories published by commercial con-

² Commonwealth Fund, American and Canadian Hospitals, Chicago Physicians Record Company, 1937, page 68.

¹ Medical Directories, J. A. M. A. 108, 25B (Jan. 23), 1937, W-1; Pa. a Fee? *ibid.* 109, 23B (Sept. 4), 1937.

seems as unethical solicitation of patients. Officials of insurance companies have indicated clearly that commercial insurance medical directories are not used in the selection or appointment of physicians as examiners. Maybe some doctors have to pay for experiences of this kind, but reading THE JOURNAL is cheaper—and you get scientific articles also!

FRIEDLANDER BACILLUS PNEUMONIA

The reported incidence of the Friedlander bacillus as the causative agent in pneumonia varies. The organism has been found also in chronic pulmonary abscess, influenza, empyema and miscellaneous infections of the bronchial tree and larynx. The pathogenicity in man, however, is not limited to the respiratory tract. Bullock and his colleagues¹ have reviewed forty-one cases of this form of pneumonia at the Harlem Hospital fairly evenly distributed over a seven year period with the exception of November 1935, during which month there were five cases, all beginning within a span of a few days. The diagnosis of pneumonia in all the cases was made by clinical and roentgenographic study, and the Friedlander bacillus was recovered either from the blood or by pulmonary suction, or both, as well as from the sputum. The organisms were identified and typed. Of the entire group of forty-one patients, thirty-six were men ten of whom were white men and twenty-six were Negroes. All five women were Negroes. Such predisposing factors as alcoholism and trauma were only occasionally present. Approximately half of the patients contracted the disease with the suddenness characteristic of pneumococcal lobar pneumonia. Profound and rapidly progressive prostration was characteristic. In two thirds of the patients the sputum did not differ materially in appearance from that seen in pneumococcal pneumonia. The course of the illness was not marked by any unusual preponderance of extrapulmonary manifestations. The rapid dissolution was clinically characteristic. The blood count varied between polymorphonuclear leukocytosis and the frequently described leukopenia, the latter being found in approximately one third. Thirty-four patients, or 83 per cent, of the entire group died. Necropsy was performed on ten patients. The predominant lesion was a massive lobar consolidation with a viscid, gelatinous exudate. Specific serum therapy with Friedlander bacillus type A antiserum was attempted on eight patients. Omitting two patients, there were six who were treated with specific serum and thirty-five who were not so treated. Thirty of the patients not given serum died. Three of the six patients with infections due to the type A Friedlander bacillus who received specific serum therapy also died. The highest mortality of the whole group (94 per cent) occurred in patients infected with the type A Friedlander bacillus who were not given serum.

¹ Bullock J. G. M. Chess Joseph and Friedman N. B. Pneumonia Due to Bacillus Friedlander. Arch. Int. Med. 60: 735 (Nov.) 1937.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Society News—The northwestern division of the Medical Association of the State of Alabama will be addressed in Tuscaloosa, January 21, by Drs. George T. Pack, New York, on 'Indications for Surgery and Radiation Therapy in the Treatment of Cancer', Marye Y. Dabney, Birmingham, 'Sterility', Ralph McBurney, University, 'Ptomaine Poisoning, a Misnomer', Ivan C. Berrey, Birmingham, 'The Irritable Colon', and Erskine M. Chenault, Decatur, 'Skin Grafting as an Office Procedure'. Visits will be made to the Bryce Hospital, Partlow School and Veterans Administration Facility.

CALIFORNIA

Personal—The San Francisco County Medical Society adopted a resolution December 14 honoring Dr. Douglass W. Montgomery, who has completed more than fifty years in the practice of medicine. Dr. Montgomery was president of the American Dermatological Association in 1910.

New Course in Medical Stenography—A free course in medical reporting for stenographers has been established at the Evening High School of Commerce, San Francisco, with Dr. Harry M. Elder, a practicing physician, in charge. The course is open to persons who already have stenographic training and is designed to give them a thorough working knowledge of medical and surgical terms. Classes will meet Monday and Wednesday evenings from 7 to 9. The first hour will be devoted to informal discussions of the problems of the medical profession and its fight against disease. The problems of such diseases as syphilis, cancer, tuberculosis and infantile paralysis will be presented. There will be a brief study of the fundamental structure and functions of the major organs in their relation to health and disease. The danger of using "patent medicines" and nostrums and of consulting quacks in the diagnosis and treatment of diseases will be stressed. The second hour will consist of dictation on these subjects by Dr. Elder.

ILLINOIS

Personal—Dr. Loran E. Orr, formerly of Greenview, has been appointed coordinating epidemiologist to the state department of health, Springfield, according to the *Illinois Health Messenger*.—Dr. Andrew F. Barnett, Hines, has been appointed managing officer of the Anna State Hospital, succeeding the late Dr. Ralph A. Goodner.

Lectures for Nurses at Hines Hospital—A series of lectures for the nursing staff of the Edward Hines Jr. Hospital, Hines, began January 11 under the auspices of the Chicago Tuberculosis Institute. Dr. Meyer Solomon gave the first lecture, on 'Mental Health and Tuberculosis'. Other lectures include the following Chicago physicians:

Dr. Hugo O. Deuss, Treatment of Pulmonary Tuberculosis, January 18.
Dr. Paul A. Teschner, assistant director, Bureau of Health and Public Instruction, American Medical Association, The Nurse of Today, January 25.
Dr. Franklin R. Fitch, Gonorrhea and Syphilis—Twin Public Health Problems, February 1.
Dr. Jerome R. Herd, Childhood Type of Tuberculosis, February 8.
Dr. Robert S. Berghoff, The More Common Forms of Heart Disease, February 15.

Chicago

Dr. David to Give Lewis Linn McArthur Lecture—Dr. Vernon C. David, chairman of the department of surgery, Rush Medical College, will deliver the fourteenth Lewis Linn McArthur Lecture of the Frank Billings Foundation at the Institute of Medicine of Chicago, January 28, his subject will be "A Consideration of Some Etiological and Pathological Factors in Cancer of the Large Bowel".

Past Presidents to Honor Dr. Kearsley—Dr. Mary Jeannette Kearsley will be guest of honor at a dinner January 19 given by the past presidents of the Aux Plaines Branch of the Chicago Medical Society in recognition of her completion of fifty years in the practice of medicine. Dr. Morris Fishbein, Editor of THE JOURNAL, will be the principal speaker at the dinner. Dr. Kearsley is the only woman thus far to be president of the branch society.

Tuberculin Distribution Service—The Chicago Tuberculosis Institute January 1 began distribution of tuberculin to physicians of Chicago and Cook County. On request from a physician, either by telephone or by letter, the institute will send by return mail a supply of first and second strength purified protein derivative sufficient for ten skin tests. Included will be a card on which additional requests may be made when the supply on hand is exhausted or becomes old. There is no charge for the service. The institute hopes in this manner to facilitate tuberculin skin testing as an aid to early diagnosis of tuberculosis.

Joint Maternal Welfare Committee—At a meeting of seven medical and hospital societies at the Union League Club, December 16, the Joint Maternal Welfare Committee of Cook County was organized to maintain the highest possible standards for medical and hospital care of new-born infants and maternity patients. The committee is composed of representatives of the Chicago Gynecological Society, the Chicago Medical Society, the Chicago board of health, the Chicago Hospital Council, the Chicago Hospital Association, the Infant Welfare Society of Chicago and the diocesan Catholic hospitals, according to the *Chicago Tribune*. Dr. Fred L. Adair, chief of staff of the Chicago Lying-In Hospital, was elected chairman, and Arnold F. Emch, director of the Chicago Hospital Council, was appointed executive secretary.

Society News—Dr. Frank to Lecture—The Chicago Medical Society and the Chicago Gynecological Society will be addressed at the Goodman Theater January 19 by Dr. Robert T. Frank, New York, on "The Sex Hormones: Their Physiological Significance and Use in Practice."—The Chicago Pathological Society was addressed January 10 by Dr. William H. Sweet, among others, on "Toxic Changes in the Spinal Cord Resulting from Spinal Anesthesia."—A symposium on lymphoblastoma was presented before the Chicago Roentgen Society January 13 by Drs. Sol R. Rosenthal, Louis R. Limarzi, Ford K. Hick, Adolph Hartung and Theodore J. Wachowski, all members of the faculty of the University of Illinois School of Medicine.—Dr. Cecil S. O'Brien, Iowa City, will discuss "Staphylococcal Conjunctivitis" before the Chicago Ophthalmological Society January 17.—The Chicago Gynecological Society was addressed December 17 by Drs. Ralph A. Reis and Sidney D. Meserow on "Studies in the Evaluation of Mammography", David S. Hillis and Solomon J. Benenson on "Infant Mortality in 16,000 Deliveries at the Cook County Hospital", William H. Rubovits, Emanuel Taft and Frank Neuwelt, "Importance of Pathological Properties of Meconium in Relation to Cesarean Section".—Dr. Ralph K. Ghormley, Rochester, Minn., among others, addressed the Chicago Orthopaedic Society December 10 on "Some Unusual Lesions of Vertebrae".—Dr. George E. Wakerlin, among others, addressed the Chicago Society of Internal Medicine, December 20, on "Bio-Assay of the Hemopoietic Liver Principle."

KANSAS

Medical Library Reopened—The medical library at St. Francis Hospital, Wichita, which was closed in 1929, has been reopened. A new room for periodicals has been provided, in which thirty current periodicals are available. Voluntary contributions of a library club furnish the journals. The library is open to all members of the profession.

LOUISIANA

Lectures on Pediatrics—The state board of health and the committee on medical education of the state medical society have organized a series of courses on pediatrics to be conducted in all councilor districts with the exception of the first and second districts, according to the *New Orleans Medical and Surgical Journal*. The first course opened in the seventh district with the following speakers: Drs. Robert A. Strong, December 6-10, Lake Charles; Roy E. de la Houssaye, December 13-17, Opelousas; and Jack E. Strange, January 10-14, Crowley. Three courses, each consisting of a daily lecture for five consecutive days, were conducted in each district in designated centers.

MARYLAND

Birth and Death Rates—In 1936 there were 26,588 births and 21,960 deaths in Maryland, giving rates of 15.9 and 13.1 per thousand of population respectively. These rates correspond with 27,236 births and a rate of 16.3 in 1935 and 21,182 deaths with a rate of 12.7. The infant mortality rate was 69.1 per thousand live births while the maternal mortality rate was 4.7 as compared with 6.2 and 5.4 respectively in 1935. The death rate for tuberculosis was 85.2 per hundred thousand of

population, cancer 128.1 and motor vehicle accidents 2.6; diseases of the heart 304.5, bronchopneumonia 50.7, other forms of pneumonia 59.1, alcoholism 2.9, and suicide 14.9.

Transactions of International Congress of Hygiene—The state health department of Maryland has a limited number of the Transactions of the Fifteenth International Congress on Hygiene and Demography meeting in 1912, which it will be glad to distribute without cost to any physician, public health official or library desiring a set. The set consists of six volumes dealing with the following subjects: Organization and Membership, Proceedings of the Joint Sessions and General Index, Hygienic Microbiology and Parasitology, Dietetics, Hygiene, Hygienic Physiology, Hygiene of Infancy and Childhood, School Hygiene, Hygiene of Occupations, Control of Infectious Diseases, State and Municipal Hygiene, Hygiene of Traffic and Transportation, Military, Naval and Tropical Hygiene and Demography. Applications should be sent to Dr. Robert H. Riley, director of the state department of health, 2411 North Charles Street, Baltimore. The sets will be sent with express charges collect.

MASSACHUSETTS

Boston University Receives \$100,000—Dr. and Mrs. J. Emmons Briggs, Boston, have given \$100,000 to the Boston University School of Medicine. The gift includes their residence at 477 Beacon Street, which will be converted into a dormitory, according to the *Boston Post*. Dr. Briggs is professor emeritus of surgery at Boston University and has been a trustee of the university for many years.

MICHIGAN

Fund for Research on Arthritis—The fund of \$10,000 to finance a study of rheumatism at the University Hospital Ann Arbor, recently made available by the Horace Rackham Fund, has been increased, according to the *University Hospital Bulletin*. The project will now have available the interest from a million dollar endowment, which is to be used annually for not less than five and not more than ten years. Should research on arthritis be completed, any other major problem of medical research may be selected by the executive board of the graduate school of the university.

Annual Secretaries' Conference—The Michigan State Medical Society will hold its annual secretaries' conference at the Olds Hotel, Lansing, January 23, with Dr. Leland E. Holly, Muskegon, as chairman. Speakers will include

Lawrence C. Salter, medical editor *Detroit Free Press*; Public Relations by the County Medical Society;
Dr. Martin H. Hoffmann, Eloise: How to Achieve Maximum Membership
Dr. Allan W. McDonald, Detroit: Medical Practice.
Dr. Charles B. Wright, Minneapolis: trustee of the American Medical Association: Medicine in the Front Line Trenches
George T. Gundry, auditor general of Michigan: Problems of Administering the Afflicted Child Law
Dr. L. Fernald Foster, Bay City: secretary state medical society: What's Going On in Michigan

A round table discussion on preventive medicine, with Dr. Don W. Gudakunst, newly appointed state health commissioner, as chairman, will conclude the session. Speakers will be Dr. Osborne A. Brines, Detroit, cancer; Edgar E. Martmer, Detroit, immunization; Alexander M. Campbell, Grand Rapids, maternal health; Henry A. Luce, Detroit, mental hygiene; Ledru O. Gosh, Detroit, preventive medicine; Robert S. Breaker, Lansing, syphilis; and Bruce H. Douglas, Detroit, tuberculosis.

MINNESOTA

Physical Education for Women—Required physical education courses for college women appear to be justified by improvements in physical control and better attitudes toward health and physical activity, according to a study made at the University of Minnesota. A group of 368 entering freshmen participated in the regular required courses in physical education. 347 were not permitted to take part in any of the required classes and the results in the two groups were compared.

MISSISSIPPI

Society News—At a meeting of the South Mississippi Medical Society, December 8, Drs. Gilbert C. Anderson spoke on "Management of Head Injuries", Shirley C. Lyons on "Diagnosis and Treatment of Empyema" and John T. Sanders on "Management and Diagnosis of Sterility", all are of New Orleans.

New Director of Maternal and Child Health Division—Dr John A. Milne, director of the field unit for the state board of health, has been appointed director of the maternal and child health division, newspapers reported. Dr Milne will take over a position which Dr Felix Underwood has held together with his activities as state health officer. Although Dr Underwood continued as director of maternal and child health after his appointment as state health officer in 1924, it was stated, he never received the salary available for the position. The expansion of the maternal and child health program in the state now demands a full time director, it was said. Aged 37, Dr Milne graduated at the Dalhousie University Faculty of Medicine, Halifax, N. S., in 1924. Dr Hugh B. Cottrell, Indianola, since 1935 director of the Sunflower County Health Department, will succeed Dr Milne as director of the field unit, which supervises the programs of the county health units. Dr Charles R. Gillespie, Natchez, health officer of Adams County, will take the position in Sunflower County, and Dr Andrew Hedmg, formerly of Lexington, will succeed Dr Gillespie.

MISSOURI

Society News—Dr Willard Bartlett and his sons, Drs Willard Jr and Robert W. Bartlett, addressed a meeting of the St. Louis Medical Society on gonorrhea recently. A symposium on allergy was presented before the society December 7 by Lloyd R. Jones, Ph.D., and Drs Carliss Malone Stroud and Charles H. Eyeremann. The Chariton County Medical Society was addressed in Rothville November 17 by Drs August A. Werner and Ralph L. Cook, St. Louis, on "Clinical Application of Pituitary and Ovarian Hormones in Regard to Uterine Function" and "Children's Diseases of Infectious and Contagious Types" respectively. At a meeting of the Randolph-Monroe Counties Medical Society in Moberly, November 9, Drs Charles F. Sherwin and Paul C. Schnobelen, both of St. Louis, spoke on surgical treatment and x-ray examination, respectively, of cancer of the stomach and the esophagus. Among others, Dr John E. Wensley, Harrisonville, addressed the Cass County Medical Society in Harrisonville, December 9, on "Sulfanilamide: Its Actions and Uses." The South Central Counties Medical Society was addressed, among others, in Mountain Grove December 9 by Dr Stanley L. Green, Independence, on "Agranulocytic Angina or Septic Sore Throat."

NEW HAMPSHIRE

Personal—Dr Andrew J. Oberlander, Reading, Mass., has been appointed physician to the University of New Hampshire, Durham, effective January 3. Dr George G. McGregor, Durham, was in charge temporarily pending a permanent appointment. A news item in THE JOURNAL, January 1, taken from the Manchester Leader of December 4, stated that Dr McGregor had been appointed to the position.

NEW YORK

Medal Offered by Buffalo University—The University of Buffalo awards annually a gold medal for work in ophthalmology. Details may be obtained from Dr Harold W. Cowper, 543 Franklin Street, Buffalo.

Five to Ten Year Study of Influenza—The Rockefeller Foundation with the cooperation of the Westchester County Department of Health recently announced a field study of influenza to be undertaken immediately and to last from five to ten years in the township of Yorktown in the northern section of the county. The communities of Yorktown Heights, Shrub Oak and other villages including about 1000 inhabitants will be the study area. These communities were chosen because they are believed to be typical and are relatively isolated from the influence of large cities there being only a few commuters in them. The project will consist of a medical census followed by a detailed clinical and laboratory investigation of every case of respiratory disease that occurs in the area. A person's work, his health in the past, the type of germ with which he has been stricken and all other data concerning his illness will be recorded. Actual treatment will be left to local physicians, it was pointed out. This study will be unique in that observation will be continuous over several years. It is hoped by this method to obtain information not only about the presence of epidemics but about their absence. The observers can study conditions before during and after an influenza epidemic if one should strike it was said. Funds to finance the investigation for eighteen months have been

made available, but it is expected that the work will continue several years, according to Dr Matthias Nicoll, health commissioner of Westchester County.

New York City

Public Lectures at the Academy—Dr James J. Walsh will give the next public lecture at the New York Academy of Medicine, the fourth of the current series, January 27, on "Medicine in the Middle Ages." The remaining lectures will be as follows:

Raymond Pearl, Ph.D., professor of biology, Johns Hopkins University, Baltimore, "The Search for Longevity," February 27.
Edward E. Free, Ph.D., consulting chemist and physicist, The Physicist, Contribution to Medicine, March 24.
Nicholas Murray Butler, Ph.D., president of Columbia University, Medicine and the Progress of Civilization, April 28.
Dr Lewis G. Cole, "X-Rays Within the Memory of Man," May 26.

Dr Lewis Honored at Eighty—Dr Maurice J. Lewis, president of the First Institute of Podiatry and the Foot Clinics of New York, was honored at a testimonial dinner on his eightieth birthday, December 1, given at the Biltmore Hotel by various friends. Dr Lewis graduated from Albany Medical College in 1877 and was at one time instructor there in gynecology and professor of medical jurisprudence at the Albany Law School. He has served as chairman of the committee on medical legislation of the Medical Society of the State of New York, as president of the Medical Society of the County of Albany and as secretary of the New York State Board of Medical Examiners. He is the author of several books on chiropody and podiatry.

Proposed Hospital Budget of Sixty Million—Dr Sigismund S. Goldwater, commissioner of hospitals, submitted to the acting director of the budget for the city a proposed budget for his department amounting to \$60,851,627 for the nine months beginning April 1. The largest item is for new construction of general and special hospitals at an estimated cost of \$33,950,000. These include four new general hospitals to serve certain sections of Brooklyn and Queens whose needs are not now covered by either public or private hospitals, five tuberculosis hospitals or additions to present institutions, one cancer hospital on Welfare Island, one for venereal disease in Brooklyn, a new nurses' home and school for nurses at Bellevue Hospital, a laboratory and morgue at Kings County Hospital and a home for dependents on Welfare Island to replace old buildings. Eight new outpatient departments are urgently needed for work with indigents, now hampered by lack of space and lack of equipment, these are listed separately at an estimated cost of \$3,250,000. Urgent relief and expansion projects call for expenditure of \$5,620,000 in the commissioner's statement. Appropriations needed to complete construction now under way and to furnish new buildings amount to \$16,875,100.

Society News—Dr Howard Fox was elected commander of the Caduceus Post No. 818, American Legion, at a recent meeting. Drs William M. Ford, Conrad Berens and Nelson M. Holden, Brooklyn, were elected vice commanders. Drs Stafford L. Warren and Charles M. Carpenter, Rochester, addressed the Medical Society of the County of Kings December 21, on "Fever Therapy with Special Reference to Gonococcal Infection." The society will give a dinner February 22 in honor of Dr Charles H. Goodrich, Brooklyn, president of the Medical Society of the State of New York, who is a member of the Kings County society. Dr Thomas B. Fletcher, Baltimore, addressed a meeting of the New York chapter of the National Society for the Advancement of Gastro-Enterology, November 29, on "Causes of Enlargement of the Liver." A symposium on colitis was presented by Drs Joseph Felsen, Anthony Bassler, Franz J. Lust and Frank C. Yeomans. Drs Ahlan L. Barach and John Murray Steele will address the New York Heart Association at its annual meeting, January 18, on Oxygen Therapy in Heart Disease and Pulse Wave Velocity, respectively. Dr Herbert C. Chase gave an afternoon lecture before the Medical Society of the County of Queens, January 7, on cancer of the breast.

NORTH CAROLINA

Society News—Drs Julian M. Ruffin, Durham and David R. Murchison, Wilmington addressed the Third District Medical Society in November on "Amebic Dysentery" and "The Electrocardiogram as an Aid in Diagnosis" respectively. Drs Porter P. Vinson and Emory H. Anderson both of Richmond addressed the New Hanover County Medical Society, Wilmington, December 16 on "Bronchoscopy and Its Use in Treating Lung Diseases and Mediastinal Lymphosarcoma with Spontaneous Pneumothorax" respectively.

OKLAHOMA

Premedical Requirements Raised to Three Years—At a meeting of the board of regents of the University of Oklahoma, January 3, the educational requirements for admission to the school of medicine were raised from two to three years, or ninety college hours exclusive of physical education or military science. The change was made on recommendation of the faculty of the medical school, of which Dr Robert U. Patterson is dean. The new requirements will become effective with the freshman class to enter next September.

OREGON

Society News—George E. Burget, Ph.D., addressed the Multnomah County Medical Society, Portland, January 5, on 'Some Pathologic Physiology in the Intestinal Tract'. Dr Arthur J. McLean, Portland, addressed the society recently on tumors of the brain—Dr Morris L. Bridgeman, Portland, discussed 'Practical Knowledge of Pediatrics' before the Central Willamette Medical Society in Albany recently.

PENNSYLVANIA

New County Tuberculosis Hospital—A new hospital for the treatment of tuberculosis has been completed in Erie County, which will take the place of the Louise Home founded in 1914 near Erie. Dr Russell S. Anderson, recently on the staff of the Michigan State Sanatorium, Howell, has been appointed superintendent of the new hospital, which has about sixty beds. The Louise Home is to become a preventorium for children between the ages of 4 and 14. The site for the new building was provided by the Erie County Tuberculosis and Health Association.

Academy Award to Bulletin Editor—The Harrisburg Academy of Medicine has awarded its biennial prize of \$500 known as the Seibert Award to Dr Mathew H. Sherman, editor of the *Dauphin Medical Academician* for his work in that position. The prize which must be used for study in Europe was established twelve years ago in memory of Dr William H. Seibert by his sister Miss Catherine Seibert. Dr Sherman was secretary of the Dauphin County Medical Society from 1931 to 1934 and was named editor of the bulletin in 1935.

Philadelphia

Demonstrations in Otolaryngology—St. Luke's and Children's Hospital in cooperation with the ear, nose and throat section of the Philadelphia County Medical Society will present a group of graduate and clinical demonstrations at the hospital in the evening of January 20. Sixteen members of the staff will conduct the demonstrations, which will be repeated several times in order to give physicians opportunity to hear and see each one.

Society News—Speakers at the meeting of the Philadelphia Academy of Surgery, January 3 were Drs Thomas A. Shallow and Kenneth E. Fry, on 'Foreign Bodies Removed from the Intestinal Tract'; John S. Lockwood, 'Experiences with Sulfanilamide'; and J. Stewart Rodman and Helen Ingleby, 'Plasma Cell Mastitis'. Dr Ruth Stephenson, among others, addressed the Philadelphia Pediatric Society, December 14, on 'A Study of Treatment of Hypochromic Anemia in Infancy'. Dr Morris Fishbein, Chicago, Editor of THE JOURNAL addressed the Philadelphia County Medical Society at a 'Medical Economics Night' January 12 on 'Medicine and the National Policy'. Dr Francis F. Borzell, chairman of the society's medical economics committee spoke on 'The County and State Society—A Diagnostic Survey'. Detlev W. Bronk, Ph.D., delivered the seventh Weir Mitchell Oration of the College of Physicians of Philadelphia, January 5, on 'The Cellular Organization of Nervous Function'. Drs I. Charles Lintgen and Kenneth Fry, among others, addressed the Obstetrical Society of Philadelphia January 6, on 'The Sedimentation Rate in the Differential Diagnosis of Acute Appendicitis and Early Pelvic Inflammatory Disease'.

Pittsburgh

Society News—At the meeting of the Allegheny County Medical Society, December 21, the speakers were Drs George V. Foster, on 'The Use of Fascia Lata in the Repair of Hernia'; Lewis E. Etter, Warrendale, 'Undulant Fever—Three Cases Treated with Mixed Typhoid Vaccine Intravenously'; Joseph H. Barach, 'Medicine in South America'. Dr Gomer S. Llewellyn Mawbey showed motion pictures of the City Hospital and Home at Mawbey. Drs William J. Fetter and John P. Griffith addressed the Pittsburgh Surgical Society, December 10, on 'Diagnosis and Preoperative Treatment of Hyperthyroidism' and 'Surgical Treatment of Hyperthyroidism' respectively.

SOUTH CAROLINA

Symposium on Obstetrics—The committee on maternal welfare of the South Carolina Medical Association sponsored a symposium on obstetrics at the Columbia Hospital, Columbia, December 8. Drs Lester A. Wilson, professor of obstetrics, Medical College of South Carolina, Charleston, and Ivan M. Procter, Raleigh, professor of obstetrics, Wake Forest College of Medicine, were the speakers. It was voted that similar meetings should be held about every three months. Dr Robert E. Seibels, Columbia, is chairman of the maternal welfare committee.

TENNESSEE

Medical Program at Chancellor's Inauguration—Oliver C. Carmichael, LL.D., dean of the Graduate School and Senior College, Vanderbilt University, Nashville, will be inaugurated as chancellor of the university at a three day ceremony February 3-5 with a symposium on higher education in the South as the principal feature. Isaiah Bowman, Ph.D., president of Johns Hopkins University, Baltimore, will deliver the inaugural address. Part of the symposium will be devoted to medicine with the following speakers:

Dr William D. Cutter, secretary Council on Medical Education at Hospitals, American Medical Association, Chicago
Trends in Pre-medical and Medical Education
Dr Irvin Abell, Louisville, Ky., President Elect of the American Medical Association, Significant Trends in Medical Practice
Dr Wilbur C. Davison, dean of Duke University School of Medicine, Durham, N. C., A Survey of Medical Education in the South
Dr Thomas Parran, surgeon general, U. S. Public Health Service, Washington, D. C., A Forward Look at National Health

TEXAS

Semicentennial at Houston Hospital—St. Joseph's Infirmary, Houston, celebrated its fiftieth anniversary December 19. The hospital was founded in 1887 by the Sisters of Charity of the Incarnate Word. In 1895 the building was destroyed by fire and was replaced by the structure that now serves as the administration building. The first laboratory of pathology was established in 1912 and the first x-ray equipment installed in 1921. It now has 207 beds, and a new maternity and children's building is under construction.

Graduate Assembly in San Antonio—The International Post-Graduate Medical Assembly will be held in San Antonio, January 25-27. Mornings will be occupied by general sessions, luncheon meetings will be conducted according to specialty groups and seminars will be offered in the late afternoon. Speakers at the general sessions will be:

Dr Paul A. O'Leary, Rochester, Minn., Treatment of Early Syphilis
Dr Reed M. Nesbit, Ann Arbor, Mich., Pylorus of Pregnancy
Dr Frederick A. Collier, Ann Arbor, Mich., Infections of the Face and Neck
Dr Franklin B. Bogart, Chattanooga, Tenn., X-Ray Diagnosis of Pulmonary Lesions
Dr Eldridge L. Elason, Philadelphia, Fracture Wrecks
Dr Maurice C. Pincoffs, Baltimore, Causes and Consequences of Hemolysis
Dr Maurice H. Seever, Madison, Wis., A Clinical Classification and General Discussion of the Barbiturates
Dr Wiley R. Buffington, New Orleans, Interpretation of Vascular Changes in General Sclerosis
Dr Frank H. Lahey, Boston, Peptic Ulcer
Dr William Boyd, Toronto, Ont., Recent Ideas Regarding the Etiology of Cancer
Dr Gordon B. New, Rochester, Minn., What General Practitioners Should Know About the Larynx
Dr William P. Healy, New York, Diagnosis and Treatment of the Cervix
Dr Myrie G. Peterman, Milwaukee, Muscular Dystrophies

At the luncheon sessions Dr Eusebio Guajardo, Monterrey, Mexico, will also be a guest speaker. At a public meeting Wednesday evening January 26 Dr Healy will speak on cancer and Dr Roscoe R. Spencer, U. S. Public Health Service, Washington, D. C., on syphilis.

WISCONSIN

Dr Ziegler Joins Milwaukee Sanitarium—Dr Lloyd H. Ziegler, professor of neurology and psychiatry, Albany Medical College, Albany, N. Y., has been appointed associate medical director of the Milwaukee Sanitarium, Wauwatosa. Dr Ziegler graduated in medicine from the University of Minnesota Medical School, Minneapolis, after having taken his undergraduate work and a master's degree in psychology at Indiana University. His graduate training in psychology and neurology was obtained at St. Elizabeth's Hospital, Washington, D. C., the Phipps Psychiatric Clinic, Johns Hopkins Hospital, Baltimore, and at the Mayo Clinic, Rochester, Minn. He has been neurologist and psychiatrist in chief to the Albany Hospital in addition to his teaching position. Dr Ziegler will lecture at the University of Illinois School of Medicine, Chicago.

GENERAL

Society News—Dr William C Ryan, Philadelphia, was elected president of the International Association of Police and Fire Surgeons and Medical Directors of Civil Service Commissions at its annual meeting in Philadelphia in November. Dr Gerald H McMahon, Detroit, was elected vice president and Dr Harry M Archer, New York, secretary.

International Pediatric Congress to Be in Boston—Dr Henry F Helmholz, Rochester, Minn, was elected president of the International Congress of Pediatrics, which met in Rome in September. Dr Kenneth D Blackfan, Boston, is general secretary, and Dr Charles F McKhann, Boston, is assistant secretary and treasurer. The next meeting will be held in Boston, probably in August or September 1940.

Board Examinations in San Francisco—The American Board of Obstetrics and Gynecology will conduct its general oral, clinical and pathologic examinations for all candidates (groups A and B) in San Francisco June 13-14 immediately before the annual session of the American Medical Association. Applications for admission to the group A examinations must be filed in the secretary's office before April 1. The annual dinner for diplomates of the board will be at the Palace Hotel June 15, with Dr William D Cutter, secretary of the Council on Medical Education and Hospitals of the American Medical Association, as the guest speaker. For information and application blanks address the secretary, Dr Paul Titus 1015 Highland Building, Pittsburgh (6).

Scientists Seek World-Wide Cooperation—The American Association for the Advancement of Science at its meeting in Indianapolis, December 27-January 1, adopted a resolution asking the British Association for the Advancement of Science and all other scientific organizations with similar aims throughout the world "to cooperate not only in advancing the interests of science but also in promoting peace among nations and intellectual freedom in order that science may continue to advance and spread more abundantly its benefits to all mankind." In the preamble to the resolution it was pointed out that science and its applications are not only transforming the physical and mental environment of men but are adding to the complexities of their social, economic and political relations. It was also asserted that "science is wholly independent of national boundaries and races and creeds and can flourish permanently only where there is peace and intellectual freedom."

Warning Against Swindler—A Wisconsin physician has reported that a man giving the name James Buckley recently swindled physicians, hospitals and nurses who cared for him. A physician was called to a hotel to attend the man, who said he had been under treatment at the Mayo Clinic for a year and a half for cardiovascular syphilis. Examination of his heart revealed an aortic regurgitation, and a blood test was positive for syphilis. The patient was placed in a hospital, where he remained four days under the care of a special nurse. When he left the hospital not only did he pay neither the hospital nor the nurse but he stole the nurse's watch. The man is about 5 feet 11 inches tall, weighs about 200 pounds, has dark brown hair with a little gray in it. His complexion is ruddy and three teeth are missing from the upper right side of his mouth. He gave his address as 1928 West Adams, Toledo, Ohio, and told a vague story of being employed by a firm called the Toledo Edison Company. He wore a dark brown suit and hat with a dark gray overcoat. Physicians are requested to report his whereabouts to the sheriff of Brown County, Wis., or the Green Bay Police.

Proposed Memorial to Dr Stieglitz—A committee of friends, alumni of the University of Chicago and members of the American Chemical Society are planning an endowment for a lectureship in honor of Julius Stieglitz, Ph.D., for many years professor of chemistry at the university and a member of the Council on Pharmacy and Chemistry of the American Medical Association. The University of Chicago and the Chicago section of the American Chemical Society are to be sponsors of the lectureship. It is planned to alternate the lectures so that they may be given one year at the university and the next at the Chicago section. Persons wishing to contribute to the fund are asked to send their donations or pledges to Benjamin B. Freund, Ph.D., treasurer, care of the Armour Institute of Technology, 3300 Federal Street, Chicago. The chairman of the two committees in charge of the project, one representing the Chicago section of the chemical society, the other the alumni of the University, are Gustav Egloff, Ph.D., of Universal Oil Products Company, and Paul N. Leech, Ph.D., of the American Medical Association. The lectureship is to be endowed in perpetuity and the funds held in trust by the University of Chicago. Dr Stieglitz died Jan. 10, 1937.

Government Services

Children's Bureau Conference on Maternal and Infant Care

Following is the advance program for the Conference on Better Care for Mothers and Babies called by the United States Children's Bureau to meet at Washington, D. C., January 17 and 18. The meetings are being held at the Auditorium, United States National Museum, Constitution Avenue at Tenth Street N.W. except for the meeting Tuesday morning, January 18, which will be held at the White House. Representatives of the American Medical Association and of state medical societies and other medical organizations have been invited and many will attend. Information as to the proceedings of the conference will be published in THE JOURNAL as soon as available after the close of the meeting.

MONDAY, JANUARY 17

- 9 00 a m Registration
10 00 a m Auditorium United States National Museum
KATHARINE F LENROOT, Chief of the Children's Bureau, Presiding
Address of Welcome
The Secretary of Labor

THE NEED TODAY

Maternal and Child Health in Relation to the Health of All the People

Thomas Parran, Jr., M.D., Surgeon General, United States Public Health Service

What is Good Care for Mothers and Babies?

Jennings Litzenberg, M.D., Professor of Obstetrics and Gynecology, University of Minnesota Medical School
Horton Casparis, M.D., Professor of Pediatrics, Vanderbilt University School of Medicine

What is the Need Today?

Martha M. Eliot, M.D., Assistant Chief of the Children's Bureau

- 12 30 p m Luncheon—Members of the Conference Planning Committee

- 2 00 p m Auditorium United States National Museum

*WHAT IS INVOLVED IN EXTENDING GOOD CARE TO ALL MOTHERS AND BABIES**Economic Resources and Ability to Secure Good Care*

Mordecai Ezekiel, Ph.D., Economic Adviser to the Secretary of Agriculture

A. F. Hinrichs, Ph.D., Chief Economist, Bureau of Labor Statistics, United States Department of Labor

Professional Resources and Ability to Provide Good Care

M. Edward Davis, M.D., Associate Professor of Obstetrics and Gynecology, University of Chicago School of Medicine

Community Resources and Ability to Organize for Good Care

Felix J. Underwood, M.D., Executive Officer, Mississippi State Board of Health

The Challenge to the Citizen

Honorable Fiorello H. LaGuardia, Mayor of New York City
Panel to start discussion: Fred L. Adair, M.D., Hazel Corbin, R.N., George M. Lyon, M.D., C. Rufus Rorem, Ph.D., Harry S. Mustard, M.D., E. L. Bishop, M.D., Carl V. Reynolds, M.D. and others to be announced

- 8 00 p m Meetings of Special Committees

- 8 15 p m Auditorium United States National Museum

FOURTH DISCUSSION: HOW THE CHALLENGE MAY BE MET
Mrs. J. K. Pettengill, Presiding

TUESDAY, JANUARY 18

- 10 00 a m East Room of the White House

Address

Mrs. Franklin D. Roosevelt

*SYMPOSIUM: WHAT IS BEING DONE TODAY—WHAT CAN BE DONE TOMORROW**Participants*

Martha M. Eliot, M.D., Leader
B. F. Austin, M.D., Director, Bureau of Hygiene and Nursing, Alabama Department of Public Health
Jesse M. Bierman, M.D., Director, Child Welfare Division, Montana State Board of Health
Beatrice E. Tucker, M.D., Medical Director, Chicago Maternity Center, Chicago
Philip F. Williams, M.D., Assistant Professor of Obstetrics, University of Pennsylvania School of Medicine
Others to be announced

Address: The Goal We Seek

Josephine Roche

- 2 30 p m Auditorium United States National Museum

Summary of conference proceedings—Katharine F. Lenroot
Reports of special committees
Conclusions of the conference

Foreign Letters

LONDON

(From Our Regular Correspondent)

Dec 18, 1937

Association Opposes Notification of Abortion

A committee has been appointed by the Ministry of Health to inquire into the prevalence of abortion and the working of the law relating to it and to consider what steps can be taken by more effective enforcement of the law or otherwise to reduce the maternal mortality and morbidity from this cause. The proposal was made that abortion should be notifiable, but the council of the British Medical Association is strongly opposed to this, for it would impose on physicians a legal requirement to disclose information obtained in the course of a professional consultation and result in the patients becoming liable to criminal proceedings. This would deter many patients from seeking the early medical aid they need. When patients take medical advice there would be imposed on the physician an obligation which would be destructive of the mutual confidence essential to the proper relationship of physician and patient. An improper burden would be imposed on the medical profession.

The council also cannot see how notification would lead to any reduction in the mortality of procured abortion. On being called to such a case the physician takes such action as is necessary for restoration of the woman's health. In this sphere notification would only discourage the patient from taking medical advice. It is argued that compulsory notification would provide additional information on the incidence of abortion. But the majority of confinements are attended by midwives, who are already required to notify abortions to the local authority by calling in a physician on the prescribed form. The proposal is fraught with considerable practical difficulty. In many cases abortion does not produce symptoms considered sufficient to necessitate medical advice, though it might prevent later complications. In cases of unlawful intervention, medical advice would be sought only on the supervision of untoward symptoms. In both groups the effect of notification would be to reduce the number of cases in which medical advice is sought. Patients are reluctant to reveal the facts even to their confidential medical advisers, and the intrusion of third parties for the purpose of investigation would be detrimental to the patient's welfare. Any advantages resulting from the procedure would be outweighed by the disadvantages.

Precautions Against Air Raids

In moving the second reading of the Air-Raid Precautions Bill Viscount Swinton, secretary of state for air, said that early in 1936 a school for instructors was established by the Air Raids Department and that it had steadily turned out 120 trained instructors a month, who had already trained something like 200,000 volunteers. In addition, every policeman had been given antigas training. Further, a special system of training for physicians had been adopted. Sixteen physicians from different parts of the country were first given special training in the treatment of gas cases. They in turn passed through the special course 10,000 physicians and the same number of nurses. The government had manufactured 20,000,000 gas masks for the use of civilians and we were the only country in the world that had devised a system of mass production. Arrangements had been made for establishing central stores for these masks, each holding 3,000,000. From them the masks would pass out in time of need to all areas of the country. The whole of the work of finding the best methods of gas proofing buildings had been done. Experiments with incendiary bombs were the foundation of a special fire fighting equipment

which the government would provide. Against explosive bombs shelters would be provided. It was estimated that the expenditure on air civilian defense would be \$100,000,000 spread over three or four years, of which the state would supply 70 per cent and the local authorities the rest. The determination of this country to be strong and adequate in defense, whether active or passive, was equaled only by our earnest will to have peace.

A scheme for the protection from air raids of the members and staff of the houses of Parliament has been worked out. It comprises refuge accommodation, a plan of gas proofing and a supply of sandbags. The fire fighting arrangements will be strengthened. A stock of gas masks will be kept on the premises, and squads for rescue, clearance and decontamination will be raised from the industrial staff.

The Want of Coordination of Medical Services

The typhoid epidemic at Croydon (described in a previous letter) has aroused so much concern in London that the government has ordered an independent investigation, which is presided over by a well known lawyer, assisted by Sir Humphrey Rolleston as medical referee. The epidemic has led to a long letter in the *Times* from Lord Dawson, president of the Royal College of Physicians, and Sir Kave Le Fleming, chairman of the council of the British Medical Association. They draw attention to a defect in our medical administration—the want of coordination between health officers and private and hospital physicians. There are now two groups of physicians—a smaller group running enlarging municipal services and a larger group who practice in the hospitals and homes of the community, and between these is an ever widening gap. Moreover, there are now two groups of hospitals—voluntary and municipal—duplicating and even conflicting, without the machinery for coordinating their activities. Our medical services have been allowed to grow up in a haphazard way in the usual English way, and coordination and systematization will come only when it is forced on us.

PARIS

(From Our Regular Correspondent)

Dec 18, 1937

Too Many Congresses, or Abuse of Legitimate Medical Publicity

This is the title of a timely editorial in the Nov. 17, 1937, *Concours medical*. There has been a deluge of papers during recent years, so that the task of those who attempt to index them is not an enviable one. A large proportion of these communications are presented at various congresses and there was a surfeit of them during the exposition last summer. Many of the papers, the editorial by Dr. Noir states, are based on hasty observations and uncontrolled experiments which threaten to displace other more scientifically accurate papers in our journal. At the last Hepatic Insufficiency Congress held at Vienna, last September, there was an attendance of 2,000 and a proportionately large number of papers. There were eleven sections in the recent International Public Health Congress, and the number of papers read in each section would be adequate for an e. d. nary congress. Many papers have only one object in view, according to the editorial, and that is to secure publicity, from those who have no such 'urge' to see their names in print are advised to reserve their papers for the regular medical society meetings, where they can be freely discussed by those who are competent to judge their real merit. A movement ought to be initiated to limit the number of congresses by international agreement and only those should be allowed which have received the approval of the leading medical organization of the respective countries.

A fact which Dr. Noir does not mention and which is very apparent to visitors from England and the United States is

custom that is prevalent in annual medical meetings in continental Europe. There is a tradition that the number of papers which a participant can read is unlimited, so that the program is top heavy, often twenty or thirty papers constituting an afternoon's program, in addition, here in France, to the reading of reports by some one appointed at the preceding congress, which is nothing else than a review of the literature of the particular subject. Instead of discussion being limited to five minutes and a single discussion of a paper by an individual member, there is neither time limit nor restriction of the number of times a member can take part in the discussion. It is only recently that the Academie de medecine has recommended that every paper should contain a summary. At certain local societies here, such as the Academie des sciences and the Societe de biologie, only abstracts can be presented.

Latin Race Eugenics Society

An organization composed of Latin race countries interested in eugenics held its first meeting in Paris, Aug 1-3, 1937. The countries represented included Brazil, France, Italy, Mexico, Portugal and Rumania. The questions for general discussion were mixture of races and immigration, comparative value of quantitative and qualitative increase in population, effect on a country of disproportionate increase in different classes of its population, diseases of germinal plasma and their elimination, constitutional and eugenic type and influence of age of the parents, and number of births and their sequence on the characters of the children. Some of the papers on the last three of these subjects are of special interest.

Turpin and his co-workers studied 104 cases of mongolism and found that the physical characteristics represent the sum of the anomalies that can be found in either isolated or grouped form among many of the direct or collateral relatives of the patients. Certain of these dystrophies are hereditary. They do not believe that such cases can be explained as due to infection or trauma, such as compression of the fetus, for they conform better to the germinal theory, which tends to ascribe a genetic basis to every morphogenic process. It rarely happens that those presenting the clinical picture of mongolism reach adult age and can procreate. There is usually one case in a family, the age of the mother and heredity playing an important part.

Vignes called attention to the influence of alcoholism in parents on their children. It is responsible not only for the occurrence of monstrosities but also for a large percentage of nervous and mental conditions. The statistics of Grenier were quoted, showing that if only one of the parents is a chronic alcoholic addict, dipsomania will be found in 52 per cent and, if both are heavy drinkers, in 84 per cent of the children. Pearson in 1911 said that alcoholism is a mental condition and that if the children become dipsomaniacs it is because they inherit the mental defect rather than that they are hereditarily alcoholic.

Roussy and Huguennin spoke on the role of heredity in human cancer. Experimental work during recent years appears to lend support to the existence of a hereditary predisposition to cancer, the most important contribution being that of Maud Slye which has been confirmed by one of the investigators at the Paris Radium Institute. The observations of Roussy and Huguennin at the Cancer Institute in clinical cases do not appear to show any hereditary influence except in relatively few cases. The notion of the role of heredity in human cancer is based on cases which are difficult to interpret.

Among the papers on constitutional type and eugenics, one by Heuyer and Courthial was of interest. The subject of their paper was psychopathic constitutions in relation to eugenics. There are two opposite conceptions of the influence of heredity on psychiatric conditions. The psychiatrists believe in the existence of clear-cut hereditary morbid constitutions

which are not modified during the life of the individual. They give rise by their pathologic exaggeration to well defined psychoses. Heredity is the dominant factor, the influence of environment being of no importance.

The opposing view is based on psychoanalysis, and the supporters of this view maintain that environment and not heredity is of the greater importance. Heuyer and Courthial said that neither of these theories corresponds to clinical observations. One cannot admit that heredity has the greatest influence on the formation of character of a child. The character forms at a certain period of life independently of environmental influences except in cases in which a chronic intoxication or severe injury exerts a modifying influence. These authors have suggested a "theory of tendencies" which exist in every child and are all hereditary. These tendencies are strong or feeble, and until the age of adolescence the influence of the environment can accentuate the "strong tendency," which develops into a veritable morbid constitution of the character. After adolescence there is no further evolution, the character being definitely formed, and it is only at this period that one can speak of a constitution. The first duty of the educator is to ascertain the individual tendencies of the child, when some appear that do not exist in the parents, one must always keep in mind some more remote hereditary influence such as hereditary syphilis or alcoholism.

Weill-Halle and Meyer reported the results of a survey of 160 families of less than five children and of eighty-four above this number, in order to determine the longevity of the children in large families. In grouping those with from five to seven children, a mortality of 15 per cent was noted, rising to 18 per cent in those having eight or more children. Large families are a rarity among those having a steady or large income in Paris, whereas the opposite is true of the laboring classes. The majority of deaths in large families is the result of inadequate medicosocial surveillance.

Honorary Professors

The minister of national education has recently conferred the title of Honorary Professor on three distinguished members of the Faculty of the Paris Medical School. Roussy who was elected rector of the University of Paris, Brindeau, obstetrician, and Sergent, phthisiologist. The last two have reached the age limit.

BERLIN

(From Our Regular Correspondent)

Nov. 29, 1937

New Law for Regulation of the Medical Profession

The national fuhrer of physicians has just proclaimed an immediately effective "Law for Regulation of German Physicians," which supersedes previous legislation of the kind and seeks to regulate every aspect of the doctor's professional life. It contains many noteworthy stipulations and provisions. The body of the statute is preceded by a preamble in which the moral obligations of the physician are defined. He is required to serve the health of the individual citizen and of the nation. Moreover, it is the duty of the medical profession as a group to preserve and promote the nation's health, sound heredity and racial purity. The public duties of the medical man have already been set forth in the national statute of physicians. The medical profession is not a trade (this statement is of great significance as it represents the answer to a long standing demand of the profession for some official pronouncement on this point). To quote further from the preamble: No piece of legislation can cover all the duties of the profession's members. The doctor who would properly discharge his obligations to society and to his colleagues must think of himself as a public servant.

This new meticulously prepared ordinance reflects the spirit of the new regime both in its cadre and in its content.

The first main division treats of general professional precepts. Professional secrecy is significantly discussed in addition to those exceptional circumstances which have heretofore absolved the doctor from this obligation, the revelation of professional secrets is now regarded as not unethical if made "in the fulfillment of a legitimate, moral duty in the interests of any objective that is felt to be socially desirable or if a menace to public welfare is the predominant consideration." If a question arises as to the ethics of such a disclosure the doctor must carefully weigh the various factors pro and con, but the public welfare should receive the benefit of any doubt. Accordingly the inviolability of an individual patient's confidences is no longer conceived as a more or less absolute professional obligation. In dubious cases the public good now definitely takes precedence over that of the patient. This new doctrine will facilitate the solution of age-old forensic problems such as that which confronts the doctor who treats a fugitive from justice and who thus becomes inadvertently the repository of guilty knowledge. A doctor's helpers, namely, nurses and so on, are likewise supposed to maintain secrecy with respect to the patients.

The physician should make every effort to combat whatever is inimical to national strength and fecundity. He should encourage the desire to procreate and in the course of his professional activities he shall discourage contraceptive measures in the absence of any legitimate grounds therefor. No interruptions of pregnancy or sterilization operations may be performed unless all legal stipulations have been satisfied.

The doctor is obliged to improve himself professionally by graduate study. He should cast aside any prejudice in favor of or against a particular trend in medicine and make himself conversant with all significant therapeutic methods. In each case of illness that he is called on to manage he should always seek the shortest route to the optimal end result. The foregoing clause is an indirect reference to the methods of nature medicine and kindred movements which, as so often mentioned in these letters, have acquired great importance in present-day Germany. Graduate medical study has for some time been regulated by law and a system of compulsory attendance on graduate courses has been in force (THE JOURNAL, Nov. 9, 1935).

Maintenance of office hours at more than one location requires a special permit. If one general practitioner maintains an office at a certain address, no other general practitioner may open an office in the same building. This holds true also for specialists in the same or in kindred disciplines. If a doctor moves away from a certain neighborhood, no other doctor can establish a practice there until six months has elapsed without the express permission of the first doctor or of the local medical organization. The local groups can, if public health considerations so demand, require that general practitioners, gynecologists and surgeons maintain both office and residence at the same address. Special permits are required for seasonal changes in the place of practice (by spa physicians, for example). No doctor should extend his practice (namely, make sick calls) beyond a circumscribed territory allotted him unless it should be a question of some area served by no other practitioners.

It is illegal for a doctor to manage a case solely by correspondence, telephone or any type of absent treatment. A doctor is forbidden to go about practicing medicine now in this place and now in that, he must maintain a permanent location. Another new provision is that a physician is now required to keep for five years at least a record of all the important clinical data accumulated in the course of his practice and of all therapeutic methods used by him. These records are amenable to the clauses regarding professional secrecy.

Great care should be exercised in the matter of expert certification and legal testimony. A doctor is forbidden to issue

any so called courtesy certificates. Professional opinion relative to the equity of a physician's honorarium may not be introduced in court excepting on special orders from the national chamber of physicians. Other activities requiring special authorization are the conducting of so called medical questionnaires (such as appear in the newspapers) and the editing or co-authorship of so called doctor-books, those manuals which encourage self treatment by the public.

No doctor may undertake the unauthorized instruction of the nursing personnel or hold any unauthorized examination of a nurse's skill or knowledge. The amount of a physician's fee is still governed by the current statute of medical honorarium. The maximal charges under this statute cannot be exceeded without special authorization or the existence of a written contract between physician and patient. A practitioner is not required to ask any remuneration for his services to indigent persons, relatives, intimate friends and colleagues and their dependents. But in all other cases he must not ask less than the legal minimum. Liquidation of honorariums due should as a rule take place at least once in four years.

A doctor should manifest for his colleagues the same respect and consideration that he expects for himself, unwarranted disparagement of the professional knowledge or the therapeutic methods of a fellow physician is highly unethical. If a doctor enters a case that has already been treated by another practitioner, he may make house visits to the patient only after he has been assured that the patient has foregone the further services of the first physician, if the patient has not informed the first doctor of the situation, the second doctor must do so himself. If a doctor is called to treat another doctor's patient in an emergency, he should immediately endeavor to do what ever the attending practitioner would wish done and then leave all subsequent treatment to the latter. If more than one doctor is called in an emergency, the first man to arrive on the scene should, in the absence of any other agreement, undertake the treatment. On the other hand the doctor may, during office hours, treat whoever comes to him with no restriction.

If one doctor is called into consultation by another, he should not refuse in the absence of some good reason. Nor should requests by the patient for the calling in of a consultant ever be refused. If a patient is referred from another doctor for treatment, the second doctor shall turn the patient over to the attending physician on the latter's request, even if the second doctor believes further treatment necessary. Agreements between doctors with regard to reciprocal substitution should be the rule. Patients taken over by a locum tenens must be relinquished to the original practitioner. The practice of a deceased physician may be carried on by substitute for a period of three months or perhaps longer for the benefit of the widows and children, such an arrangement must be authorized by the local medical organization. The locum tenens and the assistant of a still active practitioner cannot settle within the area of the doctor's practice within less than one year after termination of their association with him unless he approves of such a move. A health service doctor must abstain from treatment of the persons observed by him excepting in emergency and must in no way alienate these patients from their own family practitioners.

Spa physicians must give up their outside patient after the course of treatment, the *kur*, has ended. No outside practitioner may draw up a plan of therapy for a patient recommended to a watering place, the medical staff of the resort must be free to introduce whatever measures it deems indicated. A doctor who visits a spa for the benefit of his own health is forbidden to practice his profession there.

It is illegal for a doctor to receive compensation for his services or otherwise, in return for recommending to his patients another doctor or an institution.

The establishment of a joint practice or medical partnership is forbidden. If such an arrangement already exists it may continue only by special permission of the chamber of physicians. Joint ownership of the more elaborate medical equipment, such as x-ray apparatus, also requires a special permit.

Commercial advertising and soliciting in any way connected with medical practice is forbidden to physicians specifically no discussion of therapeutic substances and appliances in which a doctor is commercially interested must enter into his publications, lectures, radio talks and so on. Records of cases and operations are not to be discussed in print elsewhere than in the medical journals. It is illegal to advertise concerning office hours for free medical advice or concerning advice and treatment by correspondence. No doctor should treat a patient in collaboration with a lay practitioner or in any way become a party to treatment by a layman. He must never allow a lay person to perform any of his own proper duties nor may he act as strawman for lay practitioners. Disinterested lay persons are not to be permitted to witness operations, hypnosis and so on. A physician must not request or authorize the publication in newspapers or elsewhere of any testimonial or expression of gratitude relative to his professional activities. The acceptance of office in a public health organization under lay auspices is contingent on official approval. Doctors are expected to collaborate in the campaign against fraudulent therapeutic procedures, substances and appliances. A doctor must obtain a special permit if he wishes to obtain the rights of commercial exploitation of pharmaceutical innovations. This permit will be revoked at any time if it is found that the doctor's commercial activities conflict with his professional duties. All contracts relative to the mentioned enterprises are subject to official approval. It is illegal for a doctor to use his professional title for commercial purposes, as in the title of a firm or on the label of a pharmaceutical product. This prohibition would apply, for example, to a label inscribed "Remedy, prepared according to Professor X's formula." Commercial connections that become outlawed by the new legislation must be dissolved at once without exception. No doctor may request or receive any gift or favor in exchange for his prescription or recommendation of a certain drug. Only a reasonable number of pharmaceutical trade samples should be requested or used, the physician must never offer these samples for sale. No doctor may request or receive any more than a defrayal of expenses involved for the tests of and reports on a pharmaceutical substance, nor may he receive additional compensation in any form whatever for such services. The enforcement of this clause will be supervised directly by the national chamber of physicians. A doctor will allow the publication of his expert report only after he has satisfied the national chamber that he has received no extralegal remuneration. A doctor cannot allow his professional opinion or testimonial to be used by laymen for commercial purposes. For discussion and reports in which a physician recommends a particular pharmaceutical product, the author may receive no remuneration in excess of the customary honorariums paid by the journal to its contributors. In writing for publication, a doctor should be guided solely by his scientific convictions.

A doctor must not bestow favors of any sort or hold out a prospect of favors for the purpose of obtaining some professional advantage.

The proper designations of specialists are once more considered these remain substantially as described in THE JOURNAL July 27, 1935, page 294. The specific educational requirements for candidates in the specialties are basically the same with certain additions. Gynecologists must now have completed a two year course in obstetrics. Neurologists and psychiatrists must have devoted one year to the study of neurology and another year to the study of psychiatry. In general, about one year of additional study has been added

to the prerequisites for admission to all the specialties. This means an extra year of training in the discipline of choice. Each prospective specialist must now complete one year of training in general practice or internal medicine and, conversely, a prospective internist must complete a year's training in general practice, surgery or gynecology. The foregoing requirements afford the specialist first hand experience of a wide variety of clinical material outside his own particular discipline and he thus will be thoroughly grounded in the entire field of medical science. No important qualitative changes have been made in the type of training required of the candidate for a medical specialty. A doctor no longer becomes a specialist merely on the basis of a special examination. The specializing physician is now as a matter of fundamental principle excluded from general practice, he must virtually limit his activities to his own particular discipline and never permit his work to develop into a general family practice.

The next principal section of the new statute deals with public advertising by independent practitioners. Public notice of the opening of an independent practice at a certain location must contain no more than the doctor's name, office address and the same title that he is authorized to display on his nameplate. The advertisement can appear in only three editions of any one newspaper. A similar announcement may be run in the newspapers (but only in one edition of the same paper) before or after an absence of more than a fortnight on the part of the doctor or if the doctor is resuming practice after a prolonged illness. The national chamber of physicians exercises direct supervision of these public advertisements. The form and size of the advertisement are regulated by local custom. Information with respect to establishment of practice, absence or illness must be made public solely by means of the mentioned announcements in the press.

The nameplates displayed by physicians are subject to drastic regulation. In general only the following information may appear on the sign: doctor's name, academic title (Dr med and so on), official designation as general practitioner or specialist, office hours, telephone number. Certain additional styles are permitted "Obstetrician" for a general practitioner who is available for confinement cases, "Nature Medicine Practice" for a doctor who utilizes the procedures of nature medicine. Special permits, granted only if all legal requirements are satisfied, are necessary for references to homeopathy or tropical diseases. Then too the office may be legally designated "Roentgen Institute" or "Medical Diagnostic Institute." Finally, doctors specially licensed to administer serologic tests may describe themselves as "officially licensed for serologic blood examinations." The sign must not be fashioned or displayed in a way that may become obtrusive, its dimensions must not exceed 35 by 50 cm. Only in exceptional circumstances may more than one sign be displayed at the same address. The foregoing regulations likewise apply to the headings of a practitioner's letter paper, prescription blanks and so on. Members of hospital staffs are permitted to display printed references to their institutional activity on letter and prescription paper but not on their office signs. The official title "spa physician" will be discontinued in future.

The foregoing comprise the most interesting and significant provisions of the new legislation.

At the same time new stipulations have been decreed relative to the retirement from and acquisition of a medical practice. A doctor who relinquishes his practice may accept from his successor indemnification solely for real or personal property involved in the transfer. In exceptional instances the local medical organization may authorize the payment of a special indemnity to a deceased practitioner's surviving dependents if the latter have been left in bad economic circumstances and if the late doctor's practice had been his life's work.

ITALY

(From Our Regular Correspondent)

Dec 4, 1937

Experimental Vaccination Against Tuberculosis

Dr Alberto Ascoli, in a recent lecture, reported results of studies on the preventive value of antituberculosis vaccines prepared with living or killed tubercle bacilli. The studies were carried on from 1932 to 1934 at the laboratorio di patologia comparata of the Milan University and at the istituto vaccinogeno antitubercolare of Milan. The experiments were performed on ninety-four calves, which were placed in two different groups. One group received the vaccines subcutaneously and the other intravenously. Each group consisted of four lots of animals, which were given doses of from 40 to 150 mg prepared from living bovine tubercle bacilli, or from 50 to 500 mg prepared from killed bovine or human tubercle bacilli. The organic defense induced by the vaccines was tested by inoculating the animals with several doses of virulent bovine tubercle bacilli or by placing them in contact with animals that had open pulmonary tuberculosis. The animals that were administered vaccines prepared with living tubercle bacilli and later on inoculated with virulent bovine tubercle bacilli did not develop specific lesions. Those given the vaccines prepared with killed tubercle bacilli and then placed among animals that had open tuberculosis were all contaminated with the disease.

Treatment of Pleurisy

The Federazione per la lotta contra la tubercolosi met recently, and Professor Fici of Palermo spoke on the modern trends in the treatment of parapneumothorax pleurisy. According to the speaker it is advisable to resort to thoracentesis as soon as the acute phase of pleuritis passes, especially if one believes that there is empyema. Pleural lavages are indicated besides thoracentesis when there is a tendency to chronic pleuritis and also when the exudates show, by cytologic study, a prevalence of granulocytes over lymphocytes.

Professor Bennato spoke on the surgical treatment of serofibrinous pleurisy and simple tuberculous empyema. He performed pneumothoracentesis after appearance of the acute symptoms and before formation of large amounts of exudates. In cases of serofibrinous pleurisy the operation is followed by frequent pleural lavages, which are done with solutions containing detergent substances or substances that dissolve fibrins. The solutions are used alternately by doing a series of lavages with three lavages of each substance in solution. The speaker's patients recovered by this method in 75 per cent of the cases, there was transformation in empyema in 15 per cent and the exudates were not modified in 10 per cent. Pneumothoracentesis, when not followed by lavages, gives less satisfactory results. In simple empyema the best results are obtained by lavage. By this method the speaker's patients recovered in 53 per cent of the cases.

BUCHAREST

(From Our Regular Correspondent)

Nov. 7, 1937

Decrease in Importation of German Drugs

According to *Pharmacia*, a Bucharest journal, the custom authorities, when compiling the statistics of imports of drugs and fine chemicals for recent years, established that there has been a decrease of about 30 per cent in the importation of German preparations. The surprising loss of the Rumanian market for German goods is partly the outcome of the boycott of German goods by Jewish importers and partly the result of less activity of the representatives of German pharmaceutical manufacturers. No less contributory has been the great activity of Rumanian pharmaceutical manufacturers. The restrictions on importation and the great difficulty of exporting foreign currency have

been conducive to the development of Rumanian production to such an extent that with the exception of fine chemicals a considerable part of the home demand can be supplied in Rumania.

Professor Marinescu Lectures in Paris

Dr Marinescu, professor of neurology and psychiatry at the University of Bucharest, was invited by the French government to lecture before the congresses held at the Paris exposition. Marinescu was pleased to accept this invitation and lectured before the medicopsychologic society July 23 on hysteria. Next day at the meeting of the Infantile Psychiatry Congress he read a paper which he prepared in collaboration with Jonescu-Sisesti, professor, and Kraindler, lecturer at the university of Bucharest. On the same day he accepted an invitation to read a paper at the Biotypologic Congress on the human constitution. July 28 at the Psychologic Congress at the Sorbonne under the presidency of Pierre Janet he read a paper, prepared in collaboration with professor Jonescu-Sisesti and Coppelmann. August 1 at the Congress on Eugenics and Heredity he read a paper on acromegaly and gigantism, prepared in collaboration with Jonescu-Sisesti and Alexandru Bruck. The vigor of this aged man was the subject of general admiration.

Prize for Best Work on Schizophrenia

A prominent professor of the Bucharest university, who recently retired from his position, deposited 800,000 lei (\$500) on behalf of the Medical Academy with the understanding that the interest of this sum every three years, 72,000 lei (\$540), shall be awarded to the author of the best work written during the past three years on the treatment of schizophrenia. Only such works shall be considered as show an undoubted real advancement. The reward will bear the name of Professor Ioan Nanu-Muscel.

Revista de Pediatrie si Puericultura

A new medical periodical, the *Revista de Pediatrie si Puericultura*, is edited by Prof. Gheorghe Popoviciu, director of the pediatric clinic in Cluj. Popoviciu used to be the collaborator of Paul Gyorgy, then professor of pediatrics at the University of Heidelberg, Germany, at present in Cleveland, with whom he wrote many papers. The new periodical will appear monthly, for the time being, and later on bimonthly. The publishers of the paper are the Societate de Pediatrie si Puericultura, in Cluj, capital city of Transylvania, and the editorial office is at the Pediatric Clinic, Cluj University.

Marriages

- HART E. VAN RIFER, Madison, Wis., to Miss Margaret Smith of Washington, D. C., Oct. 14, 1937.
DAVID E. W. WENSTRAED, Milwaukee, to Miss Margaret Letchworth of Minneapolis, Oct. 9, 1937.
OSCAR WILLIAM HURTH, Cedarburg, Wis., to Miss Margaret Ellen Kolls of Milwaukee, Oct. 19, 1937.
HERBERT J. SCHWARTZ, Ontario, Ore., to Miss Alberta Watson of Clarkstone, Wash., Oct. 14, 1937.
HAROLD HORN LOWENSTEIN, Brooklyn, to Miss Lillian Teven of New York, Nov. 21, 1937.
CLARENCE E. ZENNER of Cadott, Wis., to Miss Lorraine Huston of Milwaukee, Oct. 9, 1937.
RALPH H. HIGHMILLER, Olympia, Wash., to Miss Alice Long in Seattle, Sept. 18, 1937.
WILLIAM J. KLEIS to Miss Marion Design, both of Milwaukee, Oct. 13, 1937.
ROBERT E. WINN to Miss Elizabeth Smith, both of Dallas, Texas, Nov. 5, 1937.
CARL B. POPE to Miss Helen Hyde, both of Milwaukee, Oct. 16, 1937.

Deaths

Emmet Rixford * San Francisco, Cooper Medical College, San Francisco, 1891, professor of surgery, emeritus, Stanford University School of Medicine, where he was professor of surgery from 1909 until 1930, formerly adjunct professor of surgery and later professor of surgery at his alma mater, instructor in surgery, Training School for Military Officers, U S Army, from March to December, 1918, fellow and past president of the American Surgical Association, member and past president of the Pacific Coast Surgical Association, member of the Society of Clinical Surgery, California Academy of Medicine, California Academy of Science and the Societe Internationale de Chirurgie, fellow of the American College of Surgeons, consulting surgeon to the Lane and San Francisco hospitals, aged 72, died, January 2, in the Peter Bent Brigham Hospital, Boston

John Randolph Haynes * Los Angeles University of Pennsylvania Department of Medicine, Philadelphia, 1874, formerly associate professor of gynecology at the University of Southern California School of Medicine, president of the board of water and power commissioners at various times member of the city civil service commission, the California State Board of Charities and Correction, the Los Angeles County Public Welfare Commission and other civic bodies, and the State Council of Defense during the World War, since 1923 regent to the University of California aged 84, died Oct 30, 1937, in the Hospital of the Good Samaritan, of cerebral hemorrhage

Edward Sparhawk Hatch * New Orleans, Harvard University Medical School, Boston, 1899, member of the American Orthopedic Association and the American Academy of Orthopedic Surgeons member and past president of the Clinical Orthopedic Society fellow of the American College of Surgeons, professor of orthopedies, Tulane University Graduate School of Medicine, served during the World War, aged 62, consulting orthopedic surgeon to the New Orleans Hospital and Dispensary for Women and Children and the United States Public Health Service, chief orthopedic surgeon to the Touro Infirmary, where he died, Oct 20, 1937, of cerebral hemorrhage

David Durward Hogan * Lieut Colonel M C U S Army, Fort Des Moines, Iowa Rush Medical College, Chicago, 1896, veteran of the Spanish-American War, entered the medical corps of the regular army as a first lieutenant in 1915, was promoted to captain in 1917 and in 1935 to lieutenant colonel aged 63, died, Oct 16, 1937, in the Army and Navy General Hospital, Hot Springs National Park, Ark, of acute coronary occlusion

George Francis Keenan * Boston Tufts College Medical School, Boston, 1906, member of the New England Obstetrical and Gynecological Society, fellow of the American College of Surgeons, served during the Spanish-American and World wars, aged 58, on the staffs of the Whidden Memorial Hospital, Everett, Mass Community Hospital Winthrop and St Elizabeths Hospital, where he died, Oct 26, 1937, of pneumonia

William Hunter Workman, Newton Mass, Harvard University Medical School Boston, 1873, member of the Massachusetts Medical Society, made numerous expeditions in Ceylon, Java, India and the Himalayan mountains for the purpose of studying the people, their art and architecture, wrote various books on his exploits, aged 90, died, Oct 7, 1937, of coronary disease

Edward Lee Meierhof * New York University of Maryland School of Medicine Baltimore, 1881, member of the American Academy of Ophthalmology and Oto-Laryngology, fellow of the American College of Surgeons formerly on the staffs of the Sydenham Hospital and the New York Eye and Ear Infirmary, aged 76, died, Oct 25, 1937, of carcinoma

Everett Flood, Friendship Maine Medical School of Maine Portland, 1881, member of the Massachusetts Medical Society past president of the Boston Society of Psychiatry and Neurology for many years superintendent of the Monson State Hospital, Palmer Mass, aged 82, died Oct 16, 1937, of chronic interstitial nephritis

Francis J Hackney, Chattanooga Tenn University of the South Medical Department, Sewanee 1899 member of the Tennessee State Medical Association and the American Academy of Ophthalmology and Oto-Laryngology owner of the Hackney Eye Ear Nose and Throat Hospital aged 64, died Oct 28 1937

Willard Phelps Earngey, San Marcos, Texas, Hahnemann Medical College and Hospital, Chicago, 1915 member of the Associated Anesthetists of the United States and Canada, served during the World War, formerly county physician in Winnebago County, Ill, aged 48, died, Oct 28, 1937, of myocarditis

George Silas Drake Jr * St Louis Johns Hopkins University School of Medicine, Baltimore, 1901, served during the World War, on the staffs of the Barnard Free Skin and Cancer Hospital and St Luke's Hospital, aged 62, died Oct 28, 1937, in the Peter Bent Brigham Hospital, Boston

Oscar Nicholas Mortensen, Wisconsin Rapids, Wis College of Physicians and Surgeons of Chicago School of Medicine of the University of Illinois, 1909, fellow of the American College of Surgeons, on the staff of the Riverview Hospital, aged 51, died, Oct 24, 1937, of myocarditis

Fred Andrew Johnson * Greenville, Mich, University of Michigan Department of Medicine and Surgery, Ann Arbor 1904, formerly bank president, member of the school board and city health officer, aged 61, died, Oct 22, 1937, in Chelsea, of heart disease

James E Helms, Louisville, Ky Joplin (Mo) Medical College, 1881, Louisville Medical College, 1895 member of the Kentucky State Medical Association, aged 82, died, Oct 22, 1937, of bronchial pneumonia and cardiovascular disease

Roy Ellsworth Hall, Portland, Ore, John A Creighton Medical College, Omaha, 1914, member of the Oregon State Medical Society, served during the World War, aged 51, died, Oct 13, 1937, of hypertension and chronic nephritis

John Wesley Faust * Kansas City, Kan, Cornell University Medical College, New York 1903, past president of the Wyandotte County Medical Society, aged 60, died, Oct 29, 1937, of coronary occlusion and arteriosclerosis

Jesse Newman Reeve, Washington, D C, Georgetown University School of Medicine Washington, 1893, aged 71, died, Oct 25, 1937, in the Georgetown Hospital, of fatty degeneration of the liver, with terminal septicemia

James Dixon Collier, Powell Station, Tenn, Cincinnati College of Medicine and Surgery, 1882, University of Nashville (Tenn) Medical Department, 1882, chairman of the county high school board, aged 83, died, Oct 23, 1937

Gordon Lawrence McLellan, San Leandro, Calif, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1913, aged 48, died, Oct 28 1937, of a self-inflicted knife wound of the throat

Edwin William Link * Palestine, Texas, Bellevue Hospital Medical College, New York, 1883, past president of the Anderson County Medical Society, member of the school board, aged 79, died, Oct 24, 1937, of cancer

Willard Pierrepont Millsbaugh * Los Angeles, Columbia University College of Physicians and Surgeons, New York, 1900 on the staff of the Hospital of the Good Samaritan, aged 65 died, Oct 28 1937, of coronary occlusion

Charles Edward Thompson Jr, * Scranton, Pa, Columbia University College of Physicians and Surgeons, New York, 1923 medical superintendent of the Scranton Private Hospital, aged 38, died, Oct 17, 1937

Samuel Hammill Snider, Detroit, Queen's University Faculty of Medicine, Kingston, Ont Canada, 1881, aged 80 died Oct 31, 1937, in the Epworth Hospital, South Bend, Ind, of carcinoma of the colon

Samuel De Nosaquo * Milwaukee, Marquette University School of Medicine, Milwaukee, 1913, on the staff of the Mount Sinai Hospital, aged 58, was found dead, Oct 28, 1937, of coronary sclerosis

William Gaston * Clarksburg W Va, Eclectic Medical Institute, Cincinnati, 1884, an Affiliate Fellow of the American Medical Association, aged 78, died, Oct 19, 1937, of cardiovascular disease

Robert Hickman Burney, Oakland Calif, University Medical College of Kansas City, Mo, 1901 aged 69, died Oct 11, 1937, in Agnews, of chronic myocarditis and cerebral arteriosclerosis

Monroe D Lehr, Lykens, Pa, Jefferson Medical College of Philadelphia, 1884, member of the Medical Society of the State of Pennsylvania, aged 77, died, Oct 12, 1937, of cerebral hemorrhage

Goff MacKinnon * Seattle, University of Pennsylvania School of Medicine, Philadelphia 1916 on the staff of the Swedish Hospital aged 47 died Oct 31 1937 of coronary thrombosis

(liver iron) the arterial tension comes down to normal or nearly normal levels. This association occurs so often that it is probably not coincidental.

Thus, correction of anemia is of great importance in treating hypertensive arterial disease. Ample rest, the appropriate use of sedatives to insure relaxation, liberal fluid intake (from 2.5 to 3 liters in twenty-four hours), a balanced dietary with avoidance of condiments, spices, and more than the normal amount of salt, study of the personality problems and calm reassurance are significant adjuncts to therapy. If the etiology remains wholly obscure the only direct therapy possible is through the use of mild long continued arterial sedatives. This is often of the greatest value when no active etiologic irritants are operative. Arteriolar sedation sometimes can be obtained with small doses (0.0015 Gm or one-fourth grain) of erythrol tetranitrate three times a day or with 0.6 Gm (10 grains) of bismuth subnitrate thrice daily. Sodium or potassium thiocyanate is not safely used unless the patient is carefully observed with frequent determinations of the thiocyanate concentration in the blood.

POSSIBLE ALBUMINURIA FROM MASCARA

To the Editor—A woman aged 21, single, presents myriads of symmetrical punctate hemorrhages in the skin about the eyes. The eyes themselves are normal although prior to the appearance of the eruption there was a sensation of heat and prickling in this region. She uses rouge and in addition 'Mascara' to her eyelids weekly. I first examined her in September 1935. At that time she complained of severe abdominal pain without any definite localization and with normal pulse and temperature. Urinalysis was negative except for a specific gravity of 1.027 and a considerable amount of albumin; there were no casts. The blood pressure was then and is now about 120 systolic, 70 diastolic. There have been no further intra-abdominal manifestations since September 1935. The patient's younger sister also has practically the same condition, namely an albuminuria without casts or hypertension. Have you received reports of similar conditions following the use of Mascara about the eyelids?

RICHARD B. OLESOHN, M.D., Loughborough, Ill.

ANSWER—Mascara is a Spanish word meaning masquerader and is applied to many preparations for the eyebrows and eyelashes to darken them. Their composition varies from combinations in which lampblack is the pigment to those containing dangerous dyes. A number of reports have appeared in the last few years of severe reactions to dyes used on the eyebrows and lashes (Greenbaum, S. S. *Dermatoconjunctivitis Due to Lash-Lure, an Eyelash and Eyebrow Dye*, *THE JOURNAL*, July 29, 1933, p. 363).

That even lampblack may cause trouble is evidenced by the query (*THE JOURNAL*, March 10, 1917, p. 799) asking about the cause of a dermatitis on the arms of men who shoveled lampblack made from California fuel oil. The eruption appeared only when the men perspired. It was ascribed to the fumes of higher hydrocarbons, as benzene and naphthalene given off by lampblack when heated.

Petechial eruptions are often due to absorbed drugs, rarely to local applications. If the eruption described in the query was due to the Mascara it may have been a result of absorption. The dyes used in the more complicated forms of Mascara are aniline dyes and both they and the higher hydrocarbons in lampblack might cause a petechial eruption. To prove this relation further experiments would be needed, but their advisability for the patient is doubtful. Other possible sources of a purpuric eruption should be sought, the spleen and liver examined, a complete blood count with platelet count made and the coagulation time and bleeding time tested.

Albumin in the urine without casts can occur in (1) orthostatic albuminuria, in which the amount is small in the morning and increases as the day lengthens, (2) alimentary albuminuria, increased by ingestion of albuminous foods, (3) albuminuria due to chronic infection, chiefly staphylococcus or syphilis, (4) acute syphilitic nephritis, and (5) nephrosis.

Burden (Persistent Functional Albuminuria, *Am J M Sc* 188 242 [Aug. 1934]) examined 3,642 male students at the University of Pennsylvania and found that 64 per cent had persistent albuminuria. That this could not correctly be called functional was shown by the occasional occurrence of hyaline and granular casts in 20.3 per cent. A careful survey of this group showed little departure from the normal except that in 12 per cent there was a history of cardiorrenal disease in one parent. Results for calcium in Burden's group were normal or on the high side of normal. It was reasoned that that does not preclude a low diffusible calcium fraction favoring increased permeability of the glomerular membranes. Calcium gluconate was given by mouth 4 Gm four times a day for two weeks, to sixteen patients. In five there was no change. Six showed a definite decrease in the amount of albuminuria and five recovered entirely. Four of the latter were still albumin free a year later.

ACUTE INTESTINAL OBSTRUCTION

To the Editor—A man aged 56, became exhausted after a sleepless week preparing for a trip. The morning he was to depart he drank some brandy (as he has done all of the past twenty years) followed by some coffee. Almost at once he became nauseated and vomited. He then had some abdominal cramps. He had had no previous abdominal complaints. Following vomiting he felt somewhat better and decided to go on the trip anyway. Throughout the day the abdominal cramps gradually increased in severity and frequency. He was required to stop the automobile several times so that he could vomit. I first saw him at 7 p. m. At that time he was writhing with pain. The abdomen was distended with gas and was tympanitic. It was tender throughout with guarding with the most marked tenderness to the left and below the umbilicus with dullness in this area. No fluid was present. He was belching foul gas and at frequent intervals vomited or attempted to do so. The temperature was 97° F, the pulse 110. He had passed no gas or fecal material by rectum during the past twenty-four hours. He was encouraged to defecate and passed a hard dry stool but no gas. He was given an enema with return of practically clear fluid but no gas. He was given a hypodermic of morphine in order that he might be moved by ambulance 20 miles to the hospital for observation. He had almost no pain during the night. The following day at 1 p. m. cramps and nausea began again. These became severe at once, and visible peristalsis was present. He still had passed no gas by rectum. His temperature at that time was 99.8° F, pulse 110. Exploration was decided on and done under ether. A midline suprapubic incision was made and a much dilated red irritated fecal extruded from the wound. Clear fluid 500 cc was also present. Several small flakes of material much as seen in perforated ulcer were present. The entire colon was normal. The small intestine was inspected throughout its entire length. The bowel was distended to within three feet of the ileocecal valve. From this point on it was collapsed and not irritated. Gas could be made to pass easily from the distended to the collapsed bowel. It appeared as though there had been an obstruction at this point but that it had been relieved. No diverticula were found. The stomach and duodenum were explored; no perforations were found. The kidneys, gallbladder, liver and spleen were normal. The abdomen was closed with drainage. Twelve hours after operation he began to pass gas by rectum. He had a febrile reaction to 101° F on the second day following intra-venous dextrose but since that time his temperature has been normal. Enemas have brought large quantities of gas and fecal material. He has taken liquids and some solid without nausea or vomiting. Dietetic has disappeared. My impression is that he had a volvulus of the small intestine which relieved itself spontaneously under the ether. I would appreciate your opinion.

M. D. Arizona

ANSWER—This case is unusual in that it does not definitely fit into any typical clinical picture. It would seem that the patient was suffering from an acute obstructive process and that it is difficult to understand why such a process of more than twenty-four hours' duration would not leave more definite evidence. It is unusual to have volvulus of the small intestine without some previous operation or some acute inflammatory process which had produced anchoring adhesions. Intra-abdominal hernias, such as can occur in the intra-sigmoidal, paracecal and paraduodenal fossae, might explain the condition, or perhaps a hernia through some other exaggerated mesenteric fold or through a congenital defect, such as has been described by Treves. Prutz collected thirty-six instances of this type.

Another possibility, which would seem rather remote, is that of dynamic ileus, such as formerly was seen not uncommonly in acute lead poisoning or in certain food poisoning. In this condition a small section of the small intestine becomes spastically obstructed producing the picture of intestinal obstruction even to the development of some fluid within the abdominal cavity but without infection.

PERSISTENT SHREDS IN URINE AFTER PROSTATIC RESECTION

To the Editor—I have an infection of the urinary tract following transurethral resection. It is characterized by shreds of alkaline urine, phosphaturia and relief is obtained only in a combination of an acid diet, excessive water drinking and acidification with ammonium salts. What is the cause of the shreds and how is one to get rid of them? Are they the cause of the urine becoming alkaline? Why does it become alkaline phosphylic and cloudy if not voided frequently? Why on an acid ash diet forced fluids but without acidification is the urine still either neutral or alkaline? Granted that the only way to keep the urine clear and normal in reaction is to keep indefinitely on an acid diet copious drinking and acidification is it compatible with life and health? Is a neutral reaction normal? Would you indicate where I could look up this subject?

ROBERT FISHER, M.D., Bronx, New York

ANSWER—The persistence of infection with alkaline urine and shreds following transurethral resection is often caused by residual prostatic tissue. It is not stated what bacteria have been found in the urine on culture. In some cases infection of this kind is the result of Proteus or Salmonella, and in these bacteria cause the urine to become so alkaline that it is impossible to acidify it by ordinary method. Recent experience has shown that sulfanilamide will eliminate both Proteus and Salmonella in the majority of cases. If it does not, cystoscopic examination should be made by some expert.

urologist and if residual prostatic tissue remains it should be removed. This can usually be done by a competent trans-urethral resection.

If areas of incrustation are found in the base of the bladder these can be treated either by curettage and applications of 20 per cent silver nitrate or by continuous irrigation with acetic acid over a period of from twenty-four to forty-eight hours.

LIQUID DIET FOR TUBE FEEDING

To the Editor—My wife owing to a paralysis of the muscles of deglutition is being fed through a Levine tube sizes 14 and 16. Knowing that her time is limited and wishing to make her as comfortable as possible I should like to maintain her nutrition in the best possible way. Could you outline as specifically as possible a well balanced liquid diet that would have an adequate caloric and vitamin content? M D Oklahoma

ANSWER—The cardinal principle of tube feeding is to give the body sufficient calories and at the same time attempt to maintain a balance. The following is a list of foods from which a menu can be planned.

Acid milks	Klm
Albumin fruit juices	Lactose (10 to 20 per cent solution)
Albumin water (1 or 2 whites of eggs to a glass of water)	Maple syrup
Almond milk	Malted milk
Applesauce	Milk cows or goat's
Apricots	Oatmeal gruel
Barley water	Oil
Beans lima	Orange albumin (1 or 2 whites of eggs with juice of an orange in equal parts of water)
Beef juice	Parsnips
Beets	Pears
Bemav	Peptone solution (20 to 40 per cent)
Black coffee	Peptonized milk
Bouillon	Plain milk
Butter	Potato boiled sweet or white
Buttermilk	Prunes
Carrots	Pumpkin
Cereal waters	Ralston
Chicken broth	Rice
Chocolate	Salt
Clear and cream soups	Spinach
Cocoa	Strained cereals
Cod liver oil	Strained fruits
Cornmeal	Strained vegetables
Cream	Sugar
Cream of wheat	Tea clear
Dextrin Maltose	Tomato juice
Dryco	Turnip
Eggs (raw)	Vegetable soup
Farina	Wheatena
Fruit juices	Whites of eggs
Glucose (10 per cent solution)	
Honey	
Karo	

All food in solid form must be pureed and strained and milk or other diluent added to make proper consistency for passage through the tube. Many commercial firms offer excellent canned pureed or strained cereals, vegetables and fruits which will obviate much household labor.

It is customary to make combinations of these foods depending on volumetric and caloric necessities. Alcohol and caffeine (in the form of coffee) are at times indicated. The caloric yield per diem can readily be calculated and the volumetric intake can be restricted or amplified as desired.

The introduction of a diet too high in carbohydrates is not indicated, as the customary oral digestion is absent; hence the addition of too much carbohydrate may produce untoward intestinal symptoms.

PENTACHLORPHENOL

To the Editor—Are you able to give me any information concerning the water soluble sodium salt of pentachlorophenol, an agent which was used as a fungicide in the preparation of lumber and other forest products? I am especially interested in knowing the effects of this agent on the skin and suitable means of prevention of skin irritations.

ALLEN D. LAZENBY, M.D. Baltimore

ANSWER—Published material on the toxicity of the sodium salts of pentachlorophenol ($\text{C}_5\text{Cl}_5\text{ONa}$) is most meager. Only on the basis of similarity to other chlorinated coal tar derivatives is it possible to take any stand as to the toxic properties of this chemical. Ivanowski and Turske (*Chemical Markets* 32:327, 1933) have described the chemical preparation of certain sodium salts of chlorophenol. From such chemical description it is reasonable to believe that this fungicide in aqueous solution is so stable that it is unlikely that decomposition will take place even when the solutions are heated. On this account whatever ill effects may be produced in the procedure of wood treatment are to be attributed to the chemical itself. In view of the highly toxic properties of chlorinated naphthalenes it is desirable to regard all chlorinated phenols with apprehension until greater experience may make this concern unnecessary. It is predictable that two types of dermatitis may be produced

by chlorinated phenols: one the usual diffuse chemical rash and second "chlor-acne." Possibly more information may be obtained from the Forest Product Laboratories of the United States Department of Agriculture.

HYPERTENSION

To the Editor—A white man aged 78 came to me two months ago complaining of pain in the right shoulder radiating down the right arm, sharp shooting pains in the back (lumbar region) and vertigo. Physical examination at this time was negative except for a blood pressure of 210 systolic, 100 diastolic. I prescribed elixir of potassium thiocyanate 1 drachm (4 cc) three times a day and elixir of five bromides every four hours. On this treatment his pains vanished and his blood pressure dropped gradually to 145/90. I gradually cut the dosage on the cyanates as the pressure fell so that it was omitted entirely two weeks later when the blood pressure was 150/85. At this time the heart action was not so good as evidenced by distant heart sounds. I proceeded to digitalize the patient. Immediately his blood pressure went from 165/95 to 195/105 and the patient felt better than he had at all. Since that time his blood pressure has been variable ranging from 145/90 to 215/110. Last week an electrocardiogram was made and this was the report: The first lead was practically normal with the exception of a slurring QRS complex, upright of normal amplitude; the second lead contained considerable slurring more than the first with a widening of the QRS complex with a deflection of the QRS complex; the T wave was normal. In the third lead there was still more slurring than in the previous two leads with marked widening and complete deflection of the QRS complex. There is also a deflection of the T wave in the third lead. Urine examinations until three weeks ago were negative but since that time have been showing a strong trace of albumin. I have been advised to discontinue the digitalis on this patient because it is like whipping a tired horse. What would you advise about this and further treatment? M D Georgia

ANSWER—The experience with this patient is a common one. Many patients suffering from long continued hypertension are distressed when any therapeutic measure successfully lowers the pressure. The electrocardiogram is consistent with the change seen in hearts following hypertension. Digitalis is indicated in these patients when there is evidence of a cardiac failure. It should be used to the point at which desired results are obtained. To this treatment might be added theobromine with sodium salicylate or one of the related compounds. The activity of the patient should be restricted to a point below that which produces dyspnea.

CONGENITAL SYPHILIS WITH NEGATIVE SEROLOGIC REACTION OF MOTHER

To the Editor—A breast fed infant 3 months old shows the typical signs of florid congenital syphilis with the history that symptoms first became evident at 1 month of age. Wassermann reaction is reported four plus on the baby but both the Wassermann and the Kahn reaction of the mother are negative. In addition the mother shows no signs of the disease but reports a rash of a suspicious nature that appeared all over her body during the last month of pregnancy. This is her first marriage and first pregnancy. What should be done for the mother in the way of care and treatment? Could this be a spontaneous cure brought about by pregnancy? How can this be proved? I have allowed the baby to continue at the breast. Is this proper judgment? The father is not available for examination. Colles' law has been so variously interpreted that I am somewhat confused concerning the status of a case like this. M D California

ANSWER—In this country, physicians still hold to the concept of the maternal transmission of syphilis, believing that paternal transmission, that is, from the father directly to the offspring, is impossible. If the diagnosis of congenital syphilis in the baby is accepted as accurate, the following explanations of the situation are worthy of consideration: 1 The child may have acquired syphilis at the time of birth or shortly thereafter from some source other than the mother. 2 The mother may have a latent syphilis with a negative serologic reaction (17 per cent of these women have syphilitic children). 3 There may be a possible technical error in the test of the mother, which would warrant repetition of the blood tests from month to month. 4 The possibility of spontaneous cure by pregnancy is remote and cannot be proved, and it can be presumed to have taken place only after an observation period of five years has elapsed. With regard to treatment of the mother, two courses are open to continue with observation, making an effort to establish the diagnosis of syphilis by serologic tests or otherwise, or to consider her as having latent syphilis and carry out treatment accordingly. If the latter plan is undertaken as it probably should be, as she is apparently a young woman the treatment must be intensive in order to prevent a subsequent pregnancy terminating in another syphilitic child. There is no objection to permitting the child to remain at the breast if it is her child.

The evidence favors a diagnosis of latency in the mother rather than spontaneous cure as a result of the pregnancy. Further clinical and serologic search is necessary to establish the exact status of the mother.

TRANSMISSION OF TUBERCULOSIS

To the Editor—A woman aged 30 was diagnosed as having tuberculosis fifteen years ago and advised to take sanatorium treatment. This she did not do. She has been married and divorced and has worked all the time since the age of 17 or 18 although her general health has not been good. She is thinking of marrying again and wants to make sure that she is free from the disease and incapable of transmitting tuberculosis to any one by kissing or in any way. She had an appendectomy about five years ago and the diagnosis was made at that time of intestinal tuberculosis. About two years ago she was passing blood from the urethra at the end of urination and still does so at intervals. She had no other genito-urinary symptoms although two years ago she had pain aggravated by pressure over the right kidney and ureter. About ten days ago she had a Mantoux test with 0.5 mg of old tuberculin which was negative followed by another Mantoux test with 1 mg of old tuberculin which also was negative. The x-ray examination showed that both diaphragms were smooth. The gastrophrenic angles were clear. The heart and aorta were of normal size and position. There were multiple calcified Ghon foci in the hilar zone of the right upper lobe, the left hilus was within normal limits. There was no infiltration noted in either lung field. The diagnosis was absence of active pulmonary tuberculosis. Would you consider the patient free from active tuberculosis in all parts of her body? Would you consider it possible for her to transmit tuberculosis to any one by any method? Please explain Ghon foci.

M D, Illinois

ANSWER—The recent Mantoux tests with negative results should be repeated with larger doses of tuberculin—from 1 to 3 mg of old tuberculin or 0.005 mg of the purified protein derivative of tuberculin. If the tests continue to be negative she may be considered to be free from active tuberculosis and incapable of transmitting tuberculosis to any one.

However, the diagnosis of intestinal tuberculosis five years ago and the hematuria which may be due to renal tuberculosis are not in accord with negative tuberculin reactions although, in rare instances this might occur.

The Ghon foci on the x-ray film are calcified tuberculous tracheobronchial lymph nodes associated with the primary tubercle in the lung.

RECOVERY FROM PULMONARY TUBERCULOSIS

To the Editor—A white woman aged 35, has bilateral pulmonary tuberculosis. X-ray examination of the right side shows no activity. On the left side three cavities were present in December 1936. Pneumothorax has been instituted and the cavities are completely collapsed. The weight has increased from 88 to 115 pounds (from 40 to 52 Kg.) there is no sputum, the temperature is normal, the pulse rate is 76 or less. Clinically there is much improvement. Is there any reason why she should not be made partially ambulatory?

M D Indiana

ANSWER—There is no hard and fast rule when the patient shall be allowed to get out of bed for any length of time. If the temperature has been persistently normal for some time, the patient may be allowed to sit in a chair for half an hour a day, the period of time of sitting up being gradually extended. Then limited walking exercises may be attempted. At first only five or ten minutes a day should be taken, and if there are no ill effects the walking exercises may be increased gradually over several weeks until the patient is taking two or three hours of exercise daily.

The pneumothorax treatment begun in December 1936 should be continued and maintained for at least two years if possible, so that the cavities in the left lung may remain permanently collapsed.

BLISTER TREATMENT OF NARCOTIC ADDICTION

To the Editor—A physician (an addict) just before his death gave to a friend a treatment which he claimed would cure any dope addict of the habit with one application of the treatment. The physician claimed that he cured himself twice but that he began using the narcotics again because he had a cancer of the jaw. I have discouraged this friend concerning the treatment as I could not see logic in such a procedure. The treatment is as follows: Place a plaster of Spanish fly on the anterior abdominal wall. When a blister has formed remove the plaster so as not to break the blister. With a hypodermic syringe draw the fluid from the blister and inject it into the buttock. One treatment is supposed to cure the worst addict. Is there any rationale for such treatment? What are the dangers accompanying such a procedure and what is your opinion as to the efficacy?

M D Florida

ANSWER—The treatment is based on the theory that there is an antidotal toxic substance in the serum of addicts. It was originated by Dr. Modinos of Java. It has been extensively used throughout the Orient during the past few years to help reduce the acute withdrawal symptoms principally in the treatment of opium smokers. In addition to the serum injection therapy the patient is given by mouth tincture of opium with tincture of belladonna and nuxvomica. The day after each injection of the serum a new blister is raised. This is repeated until three or four injections have been given. In the meantime the tincture of opium is continued in rapidly diminishing doses. Also phenobarbital and pentobarbital sodium are given to obtain sleep. The bowels are kept open with compound cathartic pills. It is reported that this allows

a much more rapid and less painful withdrawal of the opiate. There is no convincing evidence of an antidotal toxin being present in the serum of narcotic addicts—it is pure assumption. There would be no danger from the treatment if strict asepsis should be maintained. Its efficacy would be in direct proportion to the patient's faith in its efficacy.

BITTERS AND ANGOSTURA BITTERS

To the Editor—Is there any justification for such concoctions as bitters? What in them is of especial value to any particular constituent whether in the tropics or elsewhere that would be a recommendation for their use internally? In the case of a prominent product Angostura Bitters the chemical is a high alcoholic content the label says 45 per cent. Perhaps the chemical laboratories already know the component parts comprising this mixture and will disclose the composition. I should be very much to know what the product is.

MORTIMER A. LASKY, M.D. Brooklyn

ANSWER—Bitters are largely a 'matter of taste', i.e. they are likely to stimulate appetite and digestion for those who relish this taste. When appetite and digestion are impaired, especially in hot weather a dose of bitters taken before a meal may rouse the stomach to more satisfactory work. Angostura Bitters may owe its value in addition to the presence of cinchona bark, and it may be this which caused the explorer von Humboldt to have been so much benefited that he brought it to Europe in 1839. This liqueur was first devised in 1832 by Surg. Gen. J. H. B. Siegart of Venezuela and it is still made according to the original formula by his descendants at Trinidad. A similar article may be obtained according to the Chemist's Recipe Book (published by the *Chemist and Druggist*, 28 Essex Street Strand London W.C.) from the following formula:

Angostura bark	4 ounces
Cinchona bark	2 ounces
Bitter orange peel	2 ounces
Galangal root	10 drachms
Cinnamon	10 drachms
Cassia buds	10 drachms
Red sandalwood	10 drachms
Cardamom seeds	1/2 ounce
Gentian root	3 drachms
Alcohol (50 per cent)	1 gallon
Rum	1 gallon
Macerate for 7 weeks and in the filtrate dissolve	
Sugar	2 pounds
Oil of cognac	20 minims

HYPERPYREXIA FROM CARBON MONOXIDE OR INFECTION

To the Editor—March 17. A Negro aged 31, was overcome by carbon monoxide gas from a gasoline engine. He was unconscious for a considerable time and it appeared that he would not recover. Since then he has had frequent chills and high fever which last for two or three days with periods of remission. This has happened eight or ten times since the accident. He complains of gastric disturbances with tightness in his chest and abdomen. Exercise and the hot sun seem to precipitate an attack of chills and fever. Laboratory work including blood count, examination for malaria, the Wassermann test and a smear for white and red blood cells have all given normal results. Physical examination gives normal results. If you have a suggestion to offer in this case I could appreciate it.

M D Georgia

ANSWER—The sequelae of severe carbon monoxide poisoning in which the patient has been unconscious may be represented by highly different bizarre manifestations. One patient may present an extensive gangrene, another total blindness, a third pulmonary hemorrhage, a fourth nephritis. Therefore it would not be remarkable if a patient had hyperpyrexia. In many instances the temperature is low, but high temperature, lasting from a day to two or three weeks, are well known. The cause of the temperature increase may be found in post-asphyxia infection, such as pneumonia, but when the temperature rise is sudden and high, this occurrence is usually related to hemorrhagic insult in the brain. The occurrence in the present instance of intermittent high temperature and chills is characteristic, particularly when these recurrences have persisted over a period of months. If the temperature rises substantially continuous, it would be within reason to expect direct hemorrhagic changes in the portion of the brain concerned with temperature control. Contrariwise, it is believed that explanation is to be found in some other portion of the brain. Intermittent chills, with elevated temperature in a George's first suggests malaria, although this apparently has been ruled out. Pyelitis is a possibility, as is also low grade infection of the respiratory tract. It is suggested that additional effort be made to associate the occurrence described with an infectious process. If these possibilities are exhausted, it becomes reasonable to accept this condition as an unusual sequel of acute carbon monoxide poisoning traceable to vascular changes within the brain or its covering.

THERAPY IN PULMONARY MONILIASIS

To the Editor—Please inform me as to the amount the frequency of administration and the length of time the medication can be continued when treating a case of pulmonary moniliasis with (a) thymol (b) gentian violet and (c) methylene blue

PAUL K. JENKINS M.D. Miami Beach Fla

ANSWER—Such information of the details of the substances in pulmonary moniliasis does not seem to be readily available. Indeed, iodide seems to be the remedy of choice, it is admitted that it fails in some cases. The following dosages of these various agents have been employed chiefly for other purposes.

(a) A total dose of 2 Gm of thymol is considered safe for adults, best given divided into three portions, taken an hour apart and administered in the form of fine powder in 0.30 Gm capsules. Fats, oils and alcohol must be avoided during treatment. The treatment may be repeated at weekly intervals. Intramuscular injection of from 2 to 3 cc of a 6 per cent oily solution has been administered daily for seven days.

(b) Gentian violet has been given by mouth in doses of 0.065 Gm administered in capsules three times daily. Intravenous injection of 5 mg per kilogram of body weight in 0.5 per cent solution has been given repeated in five hours if necessary.

(c) Methylene blue may be given in doses of from 0.4 to 0.6 Gm four times daily for many days. It may be injected intravenously in quantities of 50 cc of 1 per cent solution, repeated at intervals up to a total of 200 cc. Cyanosis may occur as the result of the formation of methemoglobin, which may require blood transfusion.

IMPERFORATE ANUS

To the Editor—A baby girl 4 months old has a cloaca. The birth weight was 6 pounds (2.7 kg.) the present weight is 12 pounds 8 ounces (5.6 kg.) What is the general opinion as to the time of operability or perforating the anus? M.D. Wyoming

ANSWER—If the baby girl has an opening of the terminal bowel into the vagina and the bowel contents are discharging freely it is better to wait until the child has reached the age of 6 to 8 years before the bowel is returned to its normal site. If however, the opening into the vagina is so small that partial obstruction results either the opening should be enlarged where it is by dilation or by a minor plastic procedure when the opening of the bowel is in the vagina at the posterior fourchette. Occasionally as the child develops the rectum and vagina will grow apart. While this is not a common occurrence it nevertheless justifies waiting for a few years before any major attempt is carried out to replace the anus to its normal site.

MICROCOCOCCUS CATARRHALIS IN URINARY INFECTIONS

To the Editor—Do you know any drug effective against Micrococcus catarrhalis in the male genito-urinary tract?

J. R. TUCKER M.D. Williamsburg Va

ANSWER—Micrococcus catarrhalis is rare as a cause of genito-urinary infections. It is impossible to diagnose the condition by Gram's stain as the organism resembles any degenerating or otherwise poorly staining staphylococcus. Growth on ordinary culture mediums is poor. Methods devised to grow cultures of the gonococcus will give cultures of Micrococcus catarrhalis. The colonies will be three or four times as large as the gonococcus and show an intense oxydase reaction.

Since sulfanilamide may have a beneficial effect on other members of the Neisseria group (THE JOURNAL, May 29, 1937, p 1855 and April 24 p 1407) it may be tried for this organism. There is as yet no standard dosage but apparently the best results have been obtained by using rather large doses. Reactions are common and may be dangerous. Close supervision by the physician is necessary. A description of sulfanilamide appears in THE JOURNAL, November 30 page 1454.

Neosphenamine 0.3 Gm intravenously is also of value. Two or three doses at weekly intervals should be used.

TULCA LENSES

In THE JOURNAL Oct 23 1937 page 1384 appeared a query and answer on the subject of Tulca Unbreakable Lenses. In the answer it was stated that when dropped into boiling water Tulca lenses became immediately distorted. Information has since been supplied that a lens has been suspended in boiling water for ten seconds and when withdrawn was tested on a Zeiss refractometer and the strength of the lens was found to be identical with its original correction. In connection with the statement that the lenses catch fire rapidly and burn with the same flame as celluloid it has been found that celluloid ignited in one fourth second and burned with the characteristic celluloid flame whereas Tulca lens material ignited in four and one fourth seconds and burned with a small flame showing the characteristic yellow of carbon with a distinct hydrogen cone.—THE EDITOR

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL January 8 page 150

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II Examinations will be held in all centers where there is a Class A medical school and five or more candidates who wish to write the examination Feb 14 16 May 9 11 (limited to a few centers) June 20 22, and Sept 12 14 Ex Sec Mr Everett S Elwood 225 S 15th St Philadelphia

SPECIAL BOARDS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Written examination for Group B applicants will be held in various cities throughout the country April 16 Applications due Feb 15 Oral examinations for Group A and B applicants will be held at San Francisco June 13 14 Sec Dr C Guy Lane 416 Marlboro St Boston

AMERICAN BOARD OF INTERNAL MEDICINE Examinations will be held in various centers of the United States and Canada Feb 14 Chairman Dr Walter L Biering 406 Sixth Ave Suite 1210 Des Moines Iowa

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY Written examinations and review of case histories for Group B candidates will be held in various cities of the United States and Canada Feb 5 General oral clinical and pathological examinations for all candidates (Groups A and B) will be conducted in San Francisco June 13 14 Application for admission to Group A examinations must be on file before April 1 Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh (6)

AMERICAN BOARD OF OPHTHALMOLOGY San Francisco June 13 Washington D C Oct 8 Oklahoma City, Nov 15 All applications should be filed immediately and case reports in duplicate must be filed not later than sixty days before the date of examination Sec Dr John Green 3720 Washington Blvd St Louis Mo

AMERICAN BOARD OF OTOLARYNGOLOGY San Francisco June 10 11 Sec Dr W P Wherry 1500 Medical Arts Bldg Omaha

AMERICAN BOARD OF RADIOLOGY San Francisco June 10 12 Sec Dr Byrl R Kirklm 102 110 Second Ave SW Rochester Minn

Maine November Examination

Dr Adam P Leighton, secretary, Maine Board of Registration of Medicine, reports the written examination held at Portland, Nov 9-10, 1937. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Eighteen candidates were examined, 17 of whom passed and one failed. Four physicians were licensed by reciprocity and one physician was licensed by endorsement after an oral examination. The following schools were represented:

School	PASSED	Year Grad	Per Cent
Boston University School of Medicine (1936)	82 85	(1934)	83
Harvard University Medical School	(1928)	78	
Tufts College Medical School (1928) 79 (1936) 86 86 (1937) 80 81	(1914)	78	
Columbia University College of Physicians and Surgeons	(1934)	85	
New York Medical College and Flower Hospital	(1936)	83	
University of Pennsylvania School of Medicine	(1937)	79	
McGill University Faculty of Medicine (1909) 76	(1932)	81	
University of Montreal Faculty of Medicine	(1937)	76	
Pennsylvania Medical School Sbanghai China	(1931)	75 5	

School	FAILED	Year Grad	Per Cent
National University of Athens School of Medicine	(1935)*	60	

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Michigan Medical School	(1924)	California	
Eclectic Medical Institute Ohio	(1905)	Ohio	
Temple University School of Medicine	(1936)	Penna	
University of Vermont College of Medicine	(1936)	Vermont	

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Harvard University Medical School	(1931) \ B M Ex		

* Verification of graduation in process

Ohio Reciprocity and Endorsement Report

Dr H M Platter, secretary, Ohio State Medical Board, reports 24 physicians licensed by reciprocity and 5 physicians licensed by endorsement on Oct 5, 1937. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Colorado School of Medicine	(1935)	Colorado	
George Washington University School of Medicine	(1916)	Dist Colum	
Georgetown University School of Medicine	(1898)	Dist Colum	
Layala University School of Medicine	(1933)	Michigan	
University of Illinois College of Medicine	(1936)	Michigan	
State University of Iowa College of Medicine	(1936)	Iowa	
University of Kansas School of Medicine	(1935) 2	Kansas	
University of Louisville School of Medicine	(1935)	California	
Tulane University of Louisiana Medical Department	(1911)	Louisiana	

Harvard University Medical School	(1933)	Maryland
University of Michigan Medical School	(1930)	Michigan
St. Louis University School of Medicine	(1934)	Missouri
New York Homeopathic Medical College and Flower Hospital	(1925)	New York
University of Pittsburgh School of Medicine	(1916)	Penna.
Meharry Medical College	(1936)	Tennessee
University of Tennessee College of Medicine	(1931)	Tennessee
Medical College of Virginia	(1922)	W. Virginia
LICENSED BY ENDORSMENT		
School	Year	Endorsement
Georgetown University School of Medicine	(1936)	B. M. Ex.
Harvard University Medical School	(1929)	B. M. Ex.
Cornell University Medical College	(1931)	B. M. Ex.
Woman's Medical College of Pennsylvania	(1934)	B. M. Ex.

Book Notices

Recent Advances in Industrial Hygiene and Medicine By T. M. Ling, M.A., B.M., M.R.C.P. Senior Medical Officer Bristol Police Foreword by J. A. Nixon, C.M.G., M.D., F.R.C.P. Member of the Industrial Health Research Board Medical Research Council. Cloth Price \$3.50. Pp. 212 with 29 illustrations. Philadelphia: P. Blakiston's Son & Co. Inc. 1937.

Industrial hygiene has in recent years come to assume an important place both in medicine and in industry. It will in future form an integral part in the medical curriculum. In this book Dr. Ling has brought together the modern advances which have been made in industrial hygiene. The recognition, prevention and cure of the occupational diseases known, say, thirty years ago and taught to the medical students of that generation form a very small part of industrial medicine of the present day. The occupational selection of employees is a problem of prime importance both to employers and to workers. Dr. Ling discusses psychic and physical aptitudes for employment in all their bearings, with wide knowledge of the progress that has been made and with considerable caution. Industrial sickness is examined from the point of view not only of engagement in dangerous trades but of industry in general. The effect of hours of work, rest pauses, refreshment intervals and wage levels on the incidence of sickness and absence are thoughtfully considered, as well as such factors as ventilation, humidity, air conditioning and lighting. The incidence of accidents, their treatment and rehabilitation after injury are fully dealt with and the valuable lessons to be learned from Bohler's clinic in Vienna are justly insisted on. Industrial fatigue, the neuroses and the well known occupational diseases all come under review. As a compendium of all the latest work, Dr. Ling's book will recommend itself to all medical practitioners, and especially to industrial physicians and medical referees under the workmen's compensation act—to employers of labor, to welfare workers, to lawyers engaged in compensation cases and to judges sitting as arbitrators in such cases.

Nouvelle pratique dermatologique Publiée par MM. Darter, Sibon,raud, Cougerot, Milhan, Prutler, Raynaud, Sezary, Clement, Simon. Seconde édition. Tome I. Dermatoses en rapport avec des réactions cutanées et des troubles humoraux, circulatoires, endocriniens, nerveux et de l'appareil hématopoïétique. Dyschromies. Par MM. L. Chatellier et al. Broché. Price 300 francs. Pp. 918 with 225 illustrations. Paris: Masson & Co. 1936.

This volume is opened by a chapter on urticaria by Flandin, Poumerou, Delille and Soulie. A general discussion of the etiology, diagnosis and treatment is well covered in the thirty-five pages devoted to the subject. This is followed by a chapter on eczema by Sezary and Horowitz. In the 108 pages the authors set forth the clinical manifestations, the histopathology, the etiology and the treatment of eczema. The chapter is too inclusive. Many of the subjects included might well be given separate treatment under special headings. Thus the photographs on pages 47, 48, 49, 58 and 69 apparently are of cases of infectious follicular dermatitis. "Eczema streptococcique" is not eczema in the American understanding of the term and eczema du sein might well be impetigo secondary to scabies. In other words this chapter could be broken down into many different and specific types of dermatitis. Much the same may be said of the chapter on dyshidrosis by Sezary and Miget. This is followed by a lengthy and scholarly article on pruritus and the prurigo by Leon Hunt. The whole subject is so well covered that it will serve for some time to come as

a reference work. Huet makes a fundamental distinction between the primary pruriginous dermatoses and the pruritus by the presence of papules in the course of evolution in the latter. The author believes that a given agent may excite in the same tissue but in different areas papules having different clinical and even anatomic appearances. He closes by stating, "Nevertheless, a large part of the pruritic dermatoses, both pure and complicated, seem to depend, first of all, on a mental factor, the importance of which merits special attention." Excellent articles follow by Nicolas and his associates on the circulatory disturbances of the blood and lymph system. Favre contributes an especially interesting chapter on angiodermite pigmentée et purpurique. In collaboration with J. S. Ferrand, ulcus cruris is exhaustively discussed. Ferrand contributes an excellent chapter on purpura. The literature is well covered and brought down to date. Chatellier covers successfully in a few pages purpura annularis of M. J. J. and Shamberg's disease. Lacapere, who died before the work was published, discusses elephantiasis and lymphangiectasias. One of the most valuable contributions to the volume is that of Nanti on the lymphoblastomas. The whole subject is so well covered and the bibliography is so complete that nothing is left to be desired. Spillmann takes up the subject of the dermatoses due to endocrine and nutritional disturbances. The twenty-six pages devoted to scleroderma are particularly instructive. He also discusses the cutaneous manifestations of thyroid disturbance. Deicium's disease, kraurosis vulvae and ulcus vulvae simplex clitoricum. A short chapter on xanthoma and gout is contributed by Watrin. Simon discusses at great length the dermatoses in connection with disturbances of the nervous system. All phases of the subject, such as disturbances of sensation, trophic disturbances, acrodynia, trophedema, mal perforans, hemiatrophia facialis, anhidrosis and Morvan's disease, are set forth. The mental and psychopathic dermatoses are also well covered. Sezary contributes a long and scholarly chapter on the dyschromias. In collaboration with Duruy, Sezary closes the volume with a chapter on epheides, lentigo, chlorasma, dermatose pigmentée peribuccale and vitiligo.

Recent Advances in Pulmonary Tuberculosis By L. S. T. Burrell, M.A., M.D., F.R.C.P. Senior Physician to Royal Free Hospital, London. Third edition. Cloth Price \$5. Pp. 320 with 70 illustrations. Philadelphia: P. Blakiston's Son & Co. Inc. 1937.

The first chapter is devoted to immunity and infectivity. The author discusses the attack of leukocytes on the tubercle bacilli when they first enter the body and points out that an initial infection does not protect the body against a subsequent excessive dose. He states further that with tuberculosis there can be no question of getting an immunity from a first infection in any way comparable to that obtained by smallpox, mumps or scarlet fever. He says that allergy may itself be a danger but that a primary infection proceeding to an acute and general tuberculosis is extremely rare. In the chapter on prevention the author calls attention to the fact that the word cure should rarely be used in connection with tuberculosis, since many patients leave the sanatorium in excellent health and yet experience shows that they are much more likely to develop progressive disease during the next few years than the ordinary individual. The Granacher system of protecting children against infection is discussed and the various methods of immunization that have been attempted are presented. Under the subject of BCG, attention is called to the Lubek disaster, to a series of deaths following the administration of BCG in Hungary, and to another series in Chile, where four of ten vaccinated children developed clinical tuberculosis. Burrell is of the opinion that BCG produces relative immunity for a time, although not sufficient to do more than delay the spread of the disease and increase by a short time the life of the infected animal. He is of the opinion that it is a wise procedure to desensitize persons who are hypersensitive to tuberculin protein. In the chapter on diagnosis the usual symptoms, physical signs and laboratory procedures are discussed. The tuberculin test is presented at some length. Blood examination such as the sedimentation test and differential leukocyte counts, are given their proper place in the examination. He states that a common source of failure to interpret a ray appearance is the attempt to draw conclusions from a film alone. He is a firm believer in the use of the fluoroscope. A long et

is devoted to prognosis, another to complications and their treatment. The subject of tuberculosis in children and bovine tuberculosis is discussed and he calls attention to the fact that, in England, 40 per cent of the cows react positively to the tuberculin test and 65 per cent of raw market milk contains live tubercle bacilli. Moreover, 23.3 per cent of the cases of extrapulmonary tuberculosis in human beings is due to the bovine type of tubercle bacillus. The last 173 pages are devoted to treatment. One chapter deals with general treatment, in which such factors as rest are discussed, another to medicinal treatment, in which the various drugs and vitamins are presented. All forms of collapse therapy are discussed in the last two chapters. The book contains twenty-two illustrations in the text, and there are forty-eight located at the end of the book. These consist of illustrations made from x-ray films of the chests of persons, ranging from those of normal chests to those with various stages of disease. Collapse therapy is beautifully illustrated. This book is well worth a place in the library of every physician who desires to augment his information on tuberculosis.

Handbuch der Biochemie des Menschen und der Tiere. Herausgegeben von Prof. Dr. phil. et med. Carl Oppenheimer. Ergänzungswerk. Band III. Second edition. Paper. Price \$4.00. 1 p. 1162 with 30 illustrations. Jena: Gustav Fischer, 1936.

Metabolism in birds, cold-blooded animals and invertebrates is first reviewed, second, specific metabolism in various biologic phenomena such as growth, pregnancy, muscular work, third, metabolism in pathologic conditions, fourth, metabolism in specific organs, and, fifth, the metabolism of specific food constituents. In the first group Gursching emphasizes temperature regulation, basal metabolic rate and relation of body surface area thereto, also starvation effects and specific dynamic action in birds and cold-blooded animals. Paul Krüger discusses the general composition and metabolism in invertebrates and frequently in various stages of metamorphosis. Under the second subdivision Hans Aron and Karl Klinke give an extensive survey on the biochemistry of growth. Zuntz on the exchange of various tissue constituents between mother and offspring, Günther Lehmann on metabolism during hard muscular work, Theodor Brugsch on metabolism during starvation and undernutrition, T. A. Maass on the effect of climate, and Pincussen on the effect of various radiations on the metabolism in the organism and various tissues. In pathologic conditions Max Reiss reviews the general and specific phases of metabolism as related to the thyroid, pituitary, adrenals and gonads. Maass reviews metabolism in hyperthermia, Peritz in nervous disorders, Aron and Klinke in deficiency diseases, and Zuntz metabolism as related to menstruation and pregnancy in women. The specific metabolism of individual tissues is presented by Karl Lohmann on muscle, heart (with Weicker), glands and endocrines, by Steindorff on the eye and by Gottschalk on tumor tissue. The metabolism of specific food constituents is reviewed by Klinke on water and minerals, by Joachim Kulnau on carbohydrates, fats, phospholipins, glycolipins and sterols, by Kurt Felz on proteins, by Adolph Gottschalk on abnormal protein metabolism, by Otto Furrh on creatine and creatinine and by Flossner on nucleic acid. The regulation mechanism, the second main division, is subdivided under the titles of nonendocrine and endocrine and vitamin regulations. The nonendocrine control is reviewed by Erich Grafe on nerve regulation of metabolism, Klothilde Gollwitzer-Meier on regulation of respiration, Josef Kapfhammer on liver in metabolism, and Heinrich Gerhartz on organs involved in blood formation and iron metabolism. Endocrine regulations are covered in the main by Max Reiss on the thyroid, adrenals, thymus, gonads, pituitary and parathyroid with Westphal emphasizing the chemistry of the sex hormones, Joachim von Ledebur reviewing the endocrine function of the pancreas and Werle the organ specific substances active in the circulation. In the last mentioned section the numerous pressor and depressor substances which have been detected by physiologic methods in various tissues and body fluids are considered. Vitamin regulation is presented by Brockmann on vitamin A, Rudy on the flavines, Heinz Ohle on ascorbic acid, Henry Albers on vitamin and plant growth stimulants, and Aron and Klinke on biology of vitamins, their quantitative estimation, distribution

and need. This addition to the well known treatise in biochemistry is of the same high standard in organization and completeness as the previous volumes. In view of the variety of views expressed in different chapters it is not surprising that one finds considerable duplication. This is not, however, a serious fault.

The Hoover Policies. By Ray Lyman Wilbur. President of Stanford University and Arthur Mestick Hyde. Cloth. Price \$3. Pp. 667. New York: Charles Scribner's Sons, 1937.

Controversialists for many years to come will use this volume as a source book of facts and arguments. The major portion of the space is devoted to a description of the policies and activities set in motion by Herbert Hoover as Secretary of Commerce and as President. These include commissions of investigation, cooperatives, protection of children, expansion of public health activities, housing, prison reform, old age pensions, unemployment insurance and "diffusion of property ownership." Hoover urged the child labor amendment, conducted an extensive investigation on waste in industry, set up machinery for collective bargaining, established the Farm Board, suggested organized planning of land use, vetoed the bonus, created machinery for the control of the radio, proposed an elaborate system of planning of flood, navigation and power works, created a new banking policy, established the Reconstruction Finance Corporation and recommended stock exchange regulation. He advocated "government-regulated business, which I believe is the American system" as contrasted with "unregulated business" or "government-dictated business." He urged the reorganization of the federal administration in the interest of efficiency, adopted special measures for the relief of those injured by drought, denounced monopoly and looked to relief by encouraging competition, and "was probably the original exponent of enlarging government programs of public works and private programs of construction as relief to unemployment in time of business depression."

Having listed this remarkable record of achievement, the tone of the book changes with the election of 1932 and becomes a criticism of the policies and measures used by the succeeding administration. The thesis of this section is that the downward swing of the depression had ended early in 1932 and that recovery was already under way at the time of the election. The conclusion is drawn that the depression from then on was due largely to the actions of the succeeding administration. This argument is supported by numerous addresses given by former President Hoover during this period. The editors have succeeded in putting together the writings and addresses with little additional matter in such a way as to make an interesting and informative, if partisan, history of the period covered.

Nouvelle pratique dermatologique. Publiée par MM. Darier, Sabouraud, Cougerot, Milian, Pautrier, Ravaut, Sezary, Clément, Simon. Secrétaire général: Clément Simon. Tome IV. Dermatoses microbiennes (fin). Dermatoses dues à des virus. Dermatoses artificielles. Par P. Blum et al. BoARDS. Price 300 francs. Pp. 964 with 333 illustrations. Paris: Masson & Co., 1936.

The volume is opened by a short article on cutaneous gangrene by Emery. This is followed by 128 pages devoted to a discussion by Milian of the subject of cutaneous infections and streptococcal infections in detail. Tribute is due to the work of Sabouraud, so ably supported by Milian, on the cutaneous manifestations of the streptococcal infections of the skin. It is unfortunate that American writers do not differentiate clearly between the streptococcal dermatoses and the staphylococcal dermatoses. If one desires to have a clear conception of the differences, one has only to read the article by Milian and the one by Sabouraud on folliculitis. Between the two is an excellent dissertation on the cutaneous complications of gonorrhea by Perrin. The same author gives a description of the lesion known in the French literature as botryomycomy but which is generally recognized now as granuloma pyogenicum or telangiectaticum. *Ulcus vulvae acutum* is set forth by Roderer and Lanzenberg. An excellent chapter is that of Ravaut and Ferrand on the virus dermatoses. This includes the verrucae, vegetations, molluscum contagiosum, herpes and zona. Gastinel contributes a long and masterly chapter on the eruptive fevers. Pemphigus is treated in an authoritative manner as only Hudelo would treat it. Ingumal lymphogranulomatosis

is described in detail by Nicolas and Favre, who originally gave to the world the description of this comparatively new and now important dermatosis. Pityriasis rosea is thoroughly discussed by Gougerot. Milian is allotted 212 pages for an exposition of the artificial dermatoses resulting from the action of the chemical, physical and mechanical agents. Every phase of the subject is thoroughly covered. Chatellier gives an excellent description of the dermatoses due to thermal changes. Radiodermatitis is discussed at length by Laborde. The volume is closed by an interesting and stimulating discussion of the effects of light on the skin by Jausion.

Syphilis The Next Great Plague to Go. By Morris Fishbein, M.D. Editor Journal of the American Medical Association and of Hygiene, the Health Magazine. Cloth. Price \$1. Pp. 70 with 11 illustrations. Philadelphia: David McKay Company, 1937.

Dr. Fishbein has written a booklet that contains a tremendous amount of factual data. He believes that with proper utilization of the knowledge now at hand it would be possible to stamp out the disease entirely. "Whether or not this result will be accomplished depends on the extent to which the people are willing to cooperate with their doctors and health departments." After a brief historical review of the discovery of the causal spirochete he discusses the progress against syphilis, emphasizing the importance of the Wassermann test, the examination of the spinal fluid and the discovery of the arsphenamines, also touching on the experimental work of culture and transmission of the disease to the lower animals. The third chapter, on the prevention of syphilis in the prospective mother and in the child, is important and contains information which unfortunately is often not possessed by the general practitioner and other physicians concerned with obstetrics and the care of the new-born. The charts and illustrations are well chosen, and due acknowledgments are made to the various sources from which they have been selected. This simple, straightforward booklet should have a wide acceptance by the public as well as by the medical profession.

Die Leberkrankheiten. Allgemeine und spezielle Pathologie und Therapie der Leber. Von Prof. Dr. Hans Eppinger, Vorstand der I. Medizinischen Universitätsklinik in Wien. Paper. Price 66 marks. Pp. 801 with 111 illustrations. Vienna: Julius Springer, 1937.

The author is too well known to require any statement as to his ability and experience. His researches on the reticulo-endothelial system, its importance in the elaboration of bile from red blood corpuscles, and the role of the spleen in many diseases of the liver are well known to all. In this rather large volume are collected an enormous amount of material from the literature and a considerable amount from American investigators and from the author's own experimental and clinical work. One can find not alone the various tests of liver function but also an explanation of the *modus operandi* and an evaluation of the test. It is impossible to elaborate on a review of this book in its entirety because the subject matter as presented is too large. The clinical discussions are as worthy of study as are the theoretical ones. It is not necessary to say that the experimental side would be interesting to the research worker. The book is well illustrated and has a large bibliography, with direct references to the topic under discussion. There are many well executed illustrations. This book recommends itself to the clinician and the research worker.

A Textbook of Histology. By Harvey Ernest Jordan, A.M., Ph.D., Professor of Histology and Embryology, University of Virginia. Seventh edition. Cloth. Price \$7.50. Pp. 738 with 610 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1937.

The first edition of Jordan's textbook, which appeared in 1916 with Jordan and Ferguson as joint authors, was itself the successor to *Normal Histology and Microscopical Anatomy*, by Jeremiah S. Ferguson. The seventh edition differs from the sixth in form, the pages are larger and there are 738 instead of the 857 in the sixth edition. Thirty-nine of the 610 illustrations have been replaced by new ones, of which about half have been furnished by Prof. Irving Hardesty of Tulane University. Brief additions deal with recent ideas of functional activity. In the article on bone formation the views of Macewen Pollicard and Leriche are summarized, according to them the periosteum and the osteoblasts have no osteogenic

significance—bone formation and resorption are induced by humoral rather than by cellular factors. Osteoblasts, and especially osteoclasts, are osteolytic in function. Other text additions deal with the endocrine glands. The hormones reported by Allen and Hisaw which supplement the effect of theelin are described. Swingle's view that the cortex of the adrenal produces hormones which regulate the volume of blood and Britton's view that it is concerned also with the maintenance of carbohydrate balance are presented. Rowntree's interesting experiments on the thymus and pineal function, cumulative through several generations, are reported that the thymus promoting early development and that of the pineal retarding growth but accelerating differentiation (precocious dwarfism).

Physiologie générale des articulations à l'état normal et pathologique. Par A. Pollicard, professeur à la Faculté de médecine de Lyon. Paper. Price 36 francs. Pp. 214 with 25 illustrations. Paris: Masson & Co., 1936.

The subject is divided into seven parts: (1) joint cartilage, (2) the fibrocartilaginous appearance next to the joint surface, that is to say, cushion-swelling-pad cap, the marginal bourrelets and the menisci, (3) the synovial lining of the joint cavity, (4) the joint cavity and the synovia which lubricates it, (5) the fibrous deposits of the joint, i.e., in the capsule and its ligaments, (6) the innervation of the joint, and (7) the periarthicular connective tissue. The author describes an ingenious apparatus called the elastometer, which he uses to determine the elasticity of the joint cartilage. The value of the manuscript is enhanced by some fine microscopic, histologic and schematic representations.

Incunabula in the Huntington Library. Compiled by Herman Ralph Mead. Cloth. Price \$7.50. Pp. 386. San Marino, California, 1931.

As usually defined, incunabula are the first printed books, those issued between the time of the origin of printing roughly 1450, to the end of the century, 1500. Nearly all the early masters of typography issued medical works. Osler's bibliography of incunabula medica, which limits itself to the dates 1467-1480, lists 208 items. The Huntington Library has long been known to have one of the most magnificent assemblages of these books in the world. In 1931 Mr. Mead published a list of the "Incunabula Medica" there, which supplied the needs of the medical bibliographer. It ranks with the catalogue of incunabula of the Boston Medical Library and the College of Physicians of Philadelphia. For general categories of medical incunabula, the research worker has Stockton Hough, Osler and the recently published short title list of scientific and medical incunabula by Arnold Klebs. The catalogue of all the incunabula at the Huntington Library just completed lists 5291 items. It follows the arrangement of Proctor's index of the British Museum and Bodleian. The items are grouped under country, then the city in the country, and then the printer in that city. Under each heading the arrangement is chronological. Two indexes, one of authors and titles and one of printers and places, occupy the last 150 pages of this valuable bibliography.

An Introduction to the Social Studies. An Elementary Textbook for Professional and Preparatory Groups. By Joseph K. Hart, Ph.D., Associate in Educational Sociology, Teachers College, Columbia University. Cloth. Price \$2. Pp. 203. New York: Macmillan Company, 1931.

The evolution from groups to communities from family to institutions and from primitive society to modern cities is briefly sketched. "In one sense, we can say that the history of the race is a history of invention and discovery. Invention is the disturbing element in social organization and it compels continuous changes in social institutions. The interplay between the practical application of inventions and the adjustment of social institutions to the necessary changes creates 'social problems'." This work, which is clearly intended for a textbook in secondary schools, postulates a great number of problems and seeks to encourage the student to work out his own solutions. The only exception is in the chapter on social professions, where perhaps, the author is least successful in giving dogmatic solutions and where alone he occasionally seems to assume that the problem of medical education leads to a conclusion that we do know that skill and knowledge must be completely socialized in some way.

Unemployment Relief in Pennsylvania January 1 1936 December 31 1936 Fourth Annual Report of the Executive Director State Emergency Relief Board Paper Pp 22 Harrisburg Pennsylvania State Emergency Relief Administration 1937

"In the fall of 1936 the State Emergency Relief Administration improved both its service to the unemployed and its efficiency of operation by establishing cash relief in the sixty-five counties which had previously granted direct relief in the form of commodity orders." By enabling families to choose the source from which they would purchase goods and to budget their own needs, cash relief has made for economy and greater efficiency and has also made it possible to simplify the method of determining eligibility and the amount of relief to be granted. Also, it is largely responsible for a decline of 61.3 per cent in the administrative personnel, while the case load decreased 39.5 per cent. The number of persons receiving relief decreased from an average of 1,636,000 in 1935 to 1,456,000 in 1936.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice Release of Original Tortfeasor Releases Physician Whose Negligence Aggravates Injury—The plaintiff sustained a fracture of the neck of his right femur as a result of being hit by an automobile. The defendant in the present action attended him. After the accident, the plaintiff sued the driver of the automobile and the suit was eventually settled out of court. The plaintiff gave the driver a written release from liability for all claims arising out of the accident. About a year later the plaintiff sued the defendant, asserting that he, the defendant, carelessly and improperly treated the fracture, with resulting injury. The trial court directed a verdict for the defendant and, after judgment on the verdict was entered, the plaintiff appealed to the Supreme Court of Pennsylvania.

The general rule is, said the Supreme Court, that there can be no recovery in a suit against a physician for negligent aggravation of injuries after a settlement has been effected with the tortfeasor who caused the accident. In the action against the driver, the plaintiff's recovery for the injury to his hip would have included the added injury caused by the alleged negligence of the defendant. Physicians, being human, said the court, are apt occasionally to lapse from prescribed standards and the likelihood of carelessness, lack of judgment or of skill, on the part of a physician employed to effect a cure for a condition caused by another's action, is therefore considered in law as an incident of the original injury. If the injured person has used ordinary care in the selection of a physician any additional harm resulting from the latter's mistake or negligence is considered as one of the elements of the damages for which the original wrongdoer is liable.

For the final condition of his hip, the plaintiff could have sued, and did sue, the driver of the automobile, for the aggravation of the original condition, the plaintiff could have sued and did sue the defendant who treated him. He could have pursued both actions to judgment. For the same injury, however, an injured party can have but one satisfaction and the receipt of such satisfaction, either as payment of a judgment recovered or consideration for a release executed by him, from a person liable for such injury necessarily works a release of all others liable for the same injury and prevents any further proceeding against them. This is true, the court pointed out, even though it was intended or the release expressly stipulated, that the other wrongdoers should not thereby be released. Nor is it material whether the tortfeasors involved committed a joint tort or concurrent or successive torts, because the principle which underlies the rule is that the injured person is given a legal remedy only to obtain compensation for the injury done to him, and when that compensation has been received from any of the wrongdoers, his right to further remedy is at an end. If a tortfeasor is liable for only a part of the damage, and

another tortfeasor only for another part, a release of one does not, of course, release the other, but where the two are liable for the same damage, no matter on what theory their respective liabilities are predicated, the rule applies.

Since in the present case the plaintiff was compensated, by a settlement with the driver of the automobile, for all injuries, both those originally and those ultimately arising out of the accident, including the aggravation of the hip condition by the defendant's alleged negligence, he cannot obtain from the defendant a second satisfaction. The judgment of the trial court for the defendant was therefore affirmed—*Thompson v Fox (Pa)*, 192 A 107.

Workmen's Compensation Acts Trophic Ulcers in Relation to Diabetes, Arteriosclerosis and Trauma—The claimant, 72 years of age, was employed by the defendant Goodwill Industries to repair toys, his employment requiring him to stand on his feet during most of the hours of work. During the period of his employment and for some time prior thereto he had suffered from arteriosclerosis of his lower extremities and from diabetes. This combination of ailments resulted in impairment of the circulation of blood in his feet, and he had had trouble with his feet. Shortly before he was compelled to leave the employment, "the bottom of his feet near the toes broke open," and he was unable to walk thereafter. This condition was diagnosed as trophic ulcers of both feet. The industrial commission found that the claimant's condition probably would have resulted from his physical infirmities irrespective of his standing position at work and dismissed his claim for compensation. The claimant thereupon brought suit to review the order of the commission and, from a judgment confirming that order, he appealed to the Supreme Court of Wisconsin.

There was no relation, said the Supreme Court, between the claimant's employment and his diabetes and arteriosclerosis. The record failed to disclose any event that constituted an accident. The evidence merely showed that the claimant ultimately broke down while employed and that the ordinary physical wear and tear of his work may have had some slight tendency to accelerate his disability. A mere breakdown due to disease is not compensable even if the physical effort involved in the work made some contribution to the final disability. The commission correctly found that the claimant was not suffering from an occupational disease and that he had not sustained an accidental injury. The judgment upholding the order of the industrial commission denying compensation was affirmed—*Schmitt v Industrial Commission et al (Wis)*, 272 N W 486.

Workmen's Compensation Acts Dissecting Aneurysm of Aorta and Its Rupture in Relation to Trauma—Nicholes was 30 years of age and in good health. In the course of his employment he assisted the operator of a caterpillar tractor, the tractor being used to push over and uproot trees and shove them and rocks to one side in grading and leveling an uneven and rough terrain. Nicholes was therefore subjected to considerable jolting and jarring. On finishing work, July 2, Nicholes was excessively tired and his abdomen pained him. When he returned home from work on July 3, on which day he had driven the tractor all day, he was still excessively weary and complained of pains in his chest and left arm. That night he died before medical aid arrived. The industrial commission entered an award in favor of the widow, and the employer brought an original certiorari proceeding in the Supreme Court of Utah to review that award.

An autopsy disclosed two tears in the intima, or inner lining of the thoracic portion of the aorta which had permitted blood to escape into the wall of the vessel and dissect its coats so that a dissecting aneurysm was formed. The aneurysm had dissected toward the heart as far as the junction of that organ with the aorta, where it ruptured and permitted blood to escape into the pericardial sac, causing what is known as a hemopericardium. Tiredness and fatigue or weariness may not of themselves be evidence of an accident or an accidental injury, said the Supreme Court, but in a normally healthy person pursuing an occupation in which normally healthy persons do not become tired or weary those things may be and frequently are symptoms of an unusual condition or a weakness, which when

properly interpreted on the basis of a subsequent examination may point quite unerringly to a cause which will bring the case within the terms of an accident arising out of or in the course of the employment. There was ample evidence, said the court, that in the operation of the tractor there was considerable jolting and jarring. There was further evidence, based on a physical examination which the employer required of Nicholes before employing him, that at the time of the employment the workman was in good physical condition. All medical witnesses before the commission agreed that such a rupture as occurred in this case can be caused either by disease, emotional stress, physical exertion or jolting and jarring. The physician who performed the autopsy and another medical witness testified that an examination of the heart indicated it to be normal except that an imprint on it evidenced a "mild carditis" of the rheumatic type which had healed years before and could not have caused the rupture. In their opinion the rupture and the dissecting aneurysm were the cause of death, and the jarring and jolting of the tractor not only could but did cause the rupture. Two physicians, called by the employer, designated certain spots on the workman's aorta as atheromatous plaques which, they testified, was a condition that could cause the rupture. All the medical witnesses agreed that the aneurysm was of recent origin, varying their estimates from a matter of hours to a maximum of ten days.

In view of this testimony, the Supreme Court was of the opinion that the industrial commission was warranted in entering an award for the widow. The award was therefore affirmed.—*Columbia Steel Co v Industrial Commission et al (Utah)*, 66 P (2d) 124

Compensation of Physicians When Fees of Medical Witnesses Taxable as Costs—By statute in Louisiana the fees and expenses of expert witnesses may be taxed as court costs. Under that act, said the court of appeal of Louisiana, Orleans, fees paid a medical witness who testifies with respect to facts learned by him prior to the occurrences out of which the litigation resulted may not be taxed as costs, since the witness does not testify as an expert witness but rather as an ordinary witness. If such a witness is called on to express an opinion as an expert, in addition to giving factual testimony, the fee paid for the opinion testimony only may be taxed as costs. If a physician, in addition to testifying as an expert witness, assists counsel at trial in the cross-examination of adverse witnesses, the part of the fee paid to such a witness that is fairly attributable to the services rendered counsel is not taxable as costs.—*Cutitto v Metropolitan Life Ins Co (La)*, 172 So 812

Workmen's Compensation Acts Psychosis Following Bilateral Herniotomy and Appendectomy—The claimant, Dehron, sustained a right inguinal hernia as a result of his employment. During the course of an operation to repair that hernia, an incipient left inguinal hernia was repaired and the claimant's appendix was removed. Prior to this time the claimant's mental condition was normal. Shortly thereafter he developed symptoms of psychosis which eventually necessitated his confinement in a sanatorium. The compensation commission awarded him compensation under the workmen's compensation act for the psychosis, finding that that condition resulted from the operation to repair the industrial hernia. The employer appealed to the superior court, Fairfield County, Conn., which affirmed the award and the case eventually reached the Supreme Court of Errors of Connecticut.

The only question before the court was whether the evidence justified the compensation commission in finding that the operation for the industrial hernia caused the claimant's psychosis. The causal relation between that operation and the psychosis, said the court, could be established only by expert testimony. The only medical expert testifying with respect to this matter stated that the three operations combined produced the psychosis and that he could not tell which of the three operations caused it or how to separate the effect of any one. To attempt to do so, in his opinion, would be mere speculation. For the commission to conclude from this testimony, said the court, that the operation for the industrial hernia caused the psychosis was a mere guess, conjecture or surmise and was entirely unwarranted by any legally sufficient evidence.

The court believed, however, that the fullest opportunity should be given the claimant to develop further facts in evidence before the compensation commissioner and remanded the proceedings. In doing so, the court said that by analogy to the law of torts the principle determinative of the defendant's liability is that when an employer is liable to compensate an injury he is also liable for any additional bodily harm resulting from acts done by third persons in rendering aid which the injury reasonably requires. With respect to medical and surgical treatment, the employer is liable for additional injuries which result from the risks normally recognized as inherent in the necessity of submitting to such treatment and not for harm caused by misconduct which is extraordinary and therefore outside such risks. On further hearing before the commission, the court said, the question would be: Did the two operations, aside from the one to repair the industrial hernia, fall within the rule? As a practical proposition, the court pointed out, the determination of that question would depend on whether or not a surgeon, exercising that care, skill and diligence which surgeons in the general neighborhood of the town in which the operations were performed possessed and utilized in like cases, confronted with the situation that was present in this case, would perform all three operations as inherent in a proper treatment for the original compensable injury.—*Dehron v Clark (Conn)*, 191 A 526

Workmen's Compensation Acts Refusal to Undergo Operation—The claimant, in the course of his employment in 1932, sustained an injury to his back that resulted in total disability. He was paid compensation under the West Virginia workmen's compensation act until August 1935 when further compensation was denied because of his refusal to submit to an operative fusion of the lumbosacral and sacral joints. He thereupon appealed to the Supreme Court of Appeals of West Virginia.

The contemplated operation, said the Supreme Court of Appeals, was not described in the record nor was its attendant suffering mentioned. Four physicians recommended it, one of whom testified that the operation was a reasonably safe one and that the claimant was in good general physical condition and that he would be relieved of disability by the operation. Five other physicians opposed the operation, differing with the other physicians in the case with respect to their diagnosis. With such sharp divergence of professional opinion, the court said, the claimant's refusal to submit to the operation was not unreasonable. An operation may be made the condition of further compensation only when surgical opinion is substantially in accord that the operation is indicated, that it is reasonably safe and not attended by unusual suffering, that it will likely produce material physical improvement, and that it is one which a person of ordinary prudence and courage would undergo for his own betterment, regardless of compensation. The Supreme Court of Appeals therefore reversed the ruling denying further compensation and remanded the case for further consideration uninfluenced by the claimant's refusal to submit to the proposed operation.—*Gillam v Workmen's Compensation Appeal Board (W Va)*, 191 S E 204

Society Proceedings

COMING MEETINGS

- American Academy of Orthopedic Surgeons, Los Angeles, Jan. 14
- Dr. Carl E. Badgley, 1313 East Ann St., Ann Arbor, Mich., Secretary
- American Orthopsychiatric Association, Chicago, Feb. 24-26
- C. La. Mar, 210 East 68th St., New York, Secretary
- Annual Congress on Medical Education and Licensure, Chicago, Feb. 24-25
- Dr. W. D. Cutter, 535 North Dearborn St., Chicago, Secretary
- Middle Section, American Laryngological, Rhinological and Otolaryngological Society, St. Louis, Jan. 26
- Dr. James B. Cotten, Chairman
- St. Louis, Chairman
- Pacific Coast Surgical Association, Los Angeles, Feb. 27-28
- Glenn Bell, University of California Hospital, San Francisco, Secretary
- Southern Section, American Laryngological, Rhinological and Otolaryngological Society, Atlanta, Ga., Jan. 24
- Dr. Murdock S. Egan, 144 Peachtree Ave., N.E., Atlanta, Ga., Chairman
- Western Section, American Laryngological, Rhinological and Otolaryngological Society, Santa Barbara, Calif., Jan. 29-30
- Dr. Arthur C. Jones, Chairman
- man Bldg., Boise, Idaho, Chairman

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them. Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

14 515 642 (Nov.) 1937

Acute and Chronic Compression of the Heart C S Beck Cleveland —p 515

*Use of Mercupurin in Treatment of Congestive Heart Failure and in Mobilization of Excess Body Fluid H J Stewart and C H Wheeler New York —p 526

Extracardiac Determinants of Site and Radiation of Pain in Angina Pectoris with Especial Reference to Shoulder Pain E P Boas and H Levy New York —p 540

Sixteen Years Experience with Heart Disease in Pregnant Women B E Hamilton Boston —p 555

Organic and Relative Insufficiency of Pulmonary Valve J McGuire and R J McNamara Cincinnati —p 562

Unusual Case of Auricular Parasystole Showing Exit Block L N Katz J L Eschelbacher and S Strauss in collaboration with S H Robertson and H Binswanger Chicago —p 571

Electrical Axis in Simultaneous Leads I Factors Increasing Dispersion of Normal Values R C Robb and Jane Sands Robb Syracuse N Y —p 588

The Symballophone Modified Stethoscope for Lateralization and Comparison of Sounds W J Kerr T L Althausen A M Bassett and M J Goldman San Francisco —p 594

*Quantitative Study of Cutaneous Capillaries in Hyperthyroidism E Roberts and J Q Griffith Jr Philadelphia —p 598

Treatment of Scleroderma by Means of Acetyl Beta Methylcholine Chloride (Miecholy) Iontophoresis A W Duryee and I S Wright New York —p 603

Fainting Attacks Resulting from Hypersensitive Carotid Sinus Reflexes H L Smith Rochester Minn —p 614

Use of Quinidine Sulfate Intravenously in Ventricular Tachycardia J Hepburn and H E Rykert Toronto —p 620

Mercupurin in Treatment of Heart Failure—Stewart and Wheeler have observed the effects of mercupurin in patients for one year and have given 438 injections of this mercurial diuretic to sixty-six patients who presented physical signs of excess fluid in the tissues. Fifty-two patients suffered from heart failure of the congestive type, nine from cirrhosis of the liver exhibiting ascites, two from the nephrotic stage of chronic glomerular nephritis, one from hydrothorax and ascites of unknown etiology, one from tuberculosis of the peritoneum exhibiting ascites and one from carcinomatosis of the pleura and peritoneum with hydrothorax and ascites. Each patient received from one to forty-five injections, 2 cc was the dose usually given. It is their impression that mercupurin is at least equal and possibly superior to salyrgan in its diuretic effect. The diuretic effect varied between 200 and 5,900 cc but was most commonly between 1,000 and 2,000 cc. Analyzed in another fashion, the urinary output was increased as much as nineteen times, but most frequently the increase did not exceed five times. It appears to be equally effective irrespective of the etiologic type of heart disease, the magnitude of the diuresis appeared to be roughly proportional to the amount of excess fluid stored within the tissues, ammonium chloride appears to enhance its diuretic effect, diuresis in patients suffering from cirrhosis of the liver exhibiting ascites appears to be less striking, although the drug was frequently effective in preventing the recurrence of ascites, good results were obtained consistently in patients suffering from chronic constrictive pericarditis. Effects that might have been construed as toxic occurred in only three patients. Thrombosis or slough did not occur at the site of injection. Of the known mercurial diuretics, mercupurin is to be preferred when it is desired to mobilize fluid.

Cutaneous Capillaries in Hyperthyroidism—Roberts and Griffith observed the capillary counts in an area of approximately 2 sq mm in normal controls and in hyperthyroid patients. The area chosen was the extensor surface of the forearm midway between the elbow and the wrist. Capillary counts were made in the same area before and after pricking

histamine into the skin. While absolute counts in different patients cannot be compared directly, percentage increase in the same patient is considered significant. Of the sixteen hyperthyroid patients, the increase averaged 16 per cent, of the fourteen controls, 120 per cent. It is suggested that in the hyperthyroid state an increased dilatation of the cutaneous circulation assists in the loss of heat by the body. However, the degree of dilatation is not related quantitatively to the height of the basal metabolic rate.

American Journal of Clinical Pathology, Baltimore

7 467 570 (Nov.) 1937

Opportunities of the Chemistry Division for Service to Clinical Medicine F W Sunderman Philadelphia —p 467

The One Hour Two Dose Glucose Tolerance Test S E Gould Detroit —p 474

Observations on the One Hour Two-Dose Dextrose Tolerance Test J S Sweeney J J Muirhead and L E Allday Dallas Texas —p 482

Control Antigen Emulsions for Microscopic Slide Precipitation Tests for Syphilis B S Kline Cleveland —p 490

Hematologic Observations on Bone Marrow Obtained by Sternal Puncture P Vogel L A Erf and N Rosenthal New York —p 498

Congenital Neuroblastoma of the Adrenal Sympathoblastoma Sympathonioma Ganglioma Embryonale Sympathetum or Sympathoma Embryonale V W Bergstrom Binghamton N Y —p 516

*Etiology and Pathology of Agranulocytic Angina Present Day Findings and Hypotheses T Fitz Hugh Jr Philadelphia —p 524

Corn Whisky and Strychnine Poisoning J C Norris Atlanta Ga —p 531

Agranulocytic Angina—Fitz-Hugh presents the chart of a case in which recovery occurred and emphasizes that the disease (which he believes to be an entity in the same sense that pernicious anemia and bronchial asthma are entities) does not involve the red cells or platelets or the so-called coagulation factors of the blood. The pathologic changes are (1) maturation arrest of the myeloid series of leukocytes at the myeloblast-myelocyte level, (2) arrest or partial nonmigration into the blood stream of the other leukocytes, (3) maintenance of normal red cell and platelet structure and function, (4) oropharyngeal and other mucosal and cutaneous ulceration and necrosis with complete or nearly complete absence of polymorphonuclear infiltration, (5) invasion by "opportunistic bacteria" with various types of ensuing sepsis and (6) recovery initiated by myelocytic hyperplasia of the bone marrow, a myelocyte crisis in the peripheral blood, sometimes a monocytosis as well, and then a return of normal polymorphonuclear and other white cells to the circulation and tissues with ensuing tissue recovery (provided some septic or necrotic process has not already gone beyond repair).

American Journal of Hygiene, Baltimore

26 423 574 (Nov.) 1937

The Age Distribution and the Infection Rate of Yaws in Jamaica G M Saunders Kingston Jamaica B W I and H Muench New York —p 423

Present Status of Hookworm Infestation in North Carolina A E Keller W S Leathers Nashville Tenn and J C Knox Raleigh N C —p 437

Prevalence and Distribution of Hookworm Infection in Egypt J A Scott —p 455

Observations on Transmission of Hookworm Infection in Egypt J A Scott —p 506

Tuberculosis Studies in Tennessee Infection Morbidity and Mortality in Families of Tuberculous H C Stewart, R S Gass Franklin Tenn R L Gauld Columbia Tenn and Ruth R Puffer —p 527

*Risk of Mortality Among Offspring of Tuberculous Parents in a Rural Area in the Nineteenth Century J Downes New York —p 557

Risk of Mortality Among Offspring of Tuberculous Parents—Downes secured a history of the parents and siblings of both the husband and the wife in each of 1,400 families in the morbidity survey. The data included the date of birth of each member of the family, the age and date of death and the cause of death for all who were deceased at the time the survey was made. The records include some families in which the offspring were born previous to 1850 as well as some in which the offspring were born since 1900. The data for this particular study consist of records for 1,062 families in which all the children were born previous to 1901. In calculating the mortality experience of the population composed of persons born previous to 1901, the parents are excluded and only the offspring who survived to 1 year of age in the 1,062 families are included. Members of the tuberculous families, born in the period 1868-1897, had an average mortality from all causes

significantly higher than the mortality observed in a sample population based on the 1,062 families from which they were drawn. In the tuberculous families a considerable excess in mortality was noted at ages from 10 to 39, the ages when in rural areas tuberculosis is known to take its highest toll of life. The average tuberculosis death rate was 72 per thousand person-years among the offspring in families in which there was a tuberculous parent. This rate compared with the average mortality in the sample population showed that the risk of mortality from tuberculosis was nine times greater for offspring in the tuberculous families than for the general population. The mortality experience in the tuberculous families of the past century was compared with that in a similar group of families drawn from the same rural area in a more recent time period. Similar death rates from all causes and from tuberculosis for all ages combined and at specific ages were noted among the offspring in the two groups. There was some indication that the risk of mortality from tuberculosis in the general population of Cattaraugus County was less in the modern period (1916-1924) than it was from forty to sixty years ago.

American Journal of Pathology, Boston

13 881 1036 (Nov.) 1937

- The Pathogenesis of Dietary Nephritis in the Rat. E. M. Medlar and N. R. Blatherwick with assistance of J. M. Connolly, Phoebe J. Bradshaw, and Susan D. Sawyer. New York—p. 881.
- *Influence of Allergy on Development of Early Tuberculous Lesions. L. Dienes and T. B. Mallory. Boston—p. 897.
- Encephalitis and Meningitis in the Chick Embryo Following Inoculation of Chorio Allantoic Membrane with Haemophilus Influenzae. Mae Gallavan. Nashville, Tenn.—p. 911.
- Infection of Chick Embryos with Haemophilus Pertussis Reproducing Pulmonary Lesions of Whooping Cough. Mae Gallavan and E. W. Goodpasture. Nashville, Tenn.—p. 927.
- Specificity of Lesion of Experimental Mumps. O. Bloch, Jr. Nashville, Tenn.—p. 939.
- Changes in the Teeth Following Parathyroidectomy. I. Effects of Different Periods of Survival Fasting and Repeated Pregnancies and Lactations on Incisor of the Rat. I. Schour, S. B. Chandler, and W. R. Tweedy. Chicago—p. 945.
- Changes in the Teeth Following Parathyroidectomy. II. Effect of Parathyroid Extract and Calciferol on Incisor of Rat. I. Schour, W. R. Tweedy, S. B. Chandler, and M. B. Engel. Chicago—p. 971.
- Morphologic Changes in Pituitaries of Rats Resulting from Combined Thyroidectomy and Gonadectomy. Isolde T. Zeckwer. Philadelphia—p. 985.
- Silver Impregnation of Reticulum in Paraffin Sections. G. Gomori. Budapest, Hungary—p. 993.
- Cerebral Medulloblastoma. W. M. Honeyman. New York—p. 1003.

Allergy and the Development of Early Tuberculous Lesions.—Dienes and Mallory undertook to test the applicability to tuberculosis of the hypothesis that allergy is the primary factor in determining the character of the early histologic response to the infection in susceptible animals. If such a theory is tenable, it must be demonstrated that the granulomatous lesions are not essential to the development of the delayed type of allergy and that tuberculin sensitivity develops at least as early as the appearance of the characteristic histologic picture in the initial tuberculous lesion. The first of these points was demonstrated by Dienes in 1930. The second of the imposed conditions was tested by an analysis of the time factors governing the development of hypersensitiveness and the appearance of mononuclear infiltration, fibroblastic proliferation and other factors of the granulomatous tissue response. Not later than the fourth day, sometimes even on the third day, the reaction of the animals to tuberculin—usually more evident to tubercle bacilli themselves—is clearly different in character from that observed in uninfected animals or in the first two days after the primary infection. It is quicker, is far more intense in proportion to the dosage used and microscopically can be shown to have the predominantly mononuclear characteristic of the delayed type of hypersensitivity. Even at this early stage the animals are clearly developing generalized tuberculin sensitivity. At approximately the same time period a distinct change in the character of the primary lesion can be demonstrated. Beginning sometimes on the third and becoming well marked on the fourth day, collections of large mononuclear phagocytes begin to appear as cuffs about the blood vessels and nerves, to infiltrate the stroma first at some distance from organisms and leukocytes but gradually to condense about them to form a wall several cells thick. At about this time the connective tissue cells begin to appear swollen and hyperchromatic, and mitotic figures begin

to appear in abundance in them. In another twenty-four hours collagen begins to be laid down and true encapsulation is initiated. The parallelism between the appearance of demonstrable hypersensitivity and the alteration of the character of the primary lesion are closer when the two inoculations are made in similar tissues.

American Journal of Physiology, Baltimore

120 649 824 (Dec.) 1937 Partial Index

- Relation of Hypophysis and Adrenal Cortex to Removal of Excess Glucose from Blood of Rats. L. T. Samuels, H. F. Schott, and H. A. Ball, with technical assistance of M. L. Lipkus and M. Chernow. Los Angeles—p. 649.
- Effect of Atropine on Gastric Secretion and Its Relation to Gastric Theory. J. S. Gray. Chicago—p. 657.
- Electrical Potentials of Cochlea and Auditory Nerve in Rabbit. H. Hearing, J. Guttman, and S. E. Barrera. New York—p. 666.
- Relation of Amniotin to Basal Metabolism of Thyroidectomized Rat. T. C. Sherwood, T. M. Wilson, and H. Boneta. Lexington, Ky.—p. 671.
- Effects of Mecholyl on Gastric Secretion. J. S. Gray and A. C. Ivy. Chicago—p. 705.
- *Rapid Decompression Following Inhalation of Helium-Oxygen Mixtures Under Pressure. E. End. Milwaukee—p. 712.
- Electrolyte and Water Changes in Muscle During Atrophy. H. M. Hines and G. C. Knowlton. Iowa City—p. 719.
- Effect of Hexylresorcinol on Absorption of Insulin from Gastro-Intestinal Tract of Dogs. R. G. Daggs, W. R. Murlin, and J. R. Murlin, with technical assistance of Ruth L. Tomboularian. Rochester, N. Y.—p. 744.
- Acetylcholine Contracture of Denervated Muscle. G. C. Knowlton and H. M. Hines. Iowa City—p. 757.
- *Relationship Between Blood Sugar Level and Rate of Sugar Utilization Affecting Theories of Diabetes. S. Soskin and R. Levine. Chicago—p. 761.
- Relation Between Summation and Inhibition in Spinal Reflex. S. Bernstein. New York—p. 798.

Rapid Decompression with Helium-Oxygen Mixtures Under Pressure.—End states that to obtain data for determining decompression tables for divers breathing helium-oxygen mixtures the designers of the Craig-Nohl diving dress served as voluntary subjects for tests which appear to establish beyond question the superiority of this artificial gas mixture over ordinary air for men working under pressure. The experiments were performed in a steel recompression chamber, 18 feet long and 7 feet in diameter, divided into an inner and an outer compartment by pressure-tight doors. In it pressures up to 44 pounds per square inch are available. For these experiments two sets of rebreathing apparatus were constructed, each consisting of a spirometer, a soda-lime chamber, valves, a airtight mouthpiece and necessary tubing and connections. Helium-oxygen or helium-nitrogen-oxygen mixtures prepared beforehand were admitted to these systems from a cylinder under pressure, and oxygen was added from another cylinder at will. The subjects breathed from these systems during the entire period of each experiment. After breathing a helium-oxygen mixture under pressure, the two subjects were uneventfully decompressed in less than one twenty-third of the time required when compressed air is breathed. Attention is called to several possibilities of helium-oxygen mixtures as a substitute for compressed air for men working under increased pressures. While the results serve fully to justify the author's expectations for helium-oxygen mixtures, they are reported in the hope that they will stimulate more work by others in this field. The fact that the two subjects have suffered no apparent ill effects following decompression in two minutes' time after having breathed a helium-oxygen mixture at a pressure equivalent to 90 feet of sea water of approximately one hour should not be interpreted by any one as an attempt to establish this as a safe rate of decompression under the circumstances. Such figures are, however, encouraging.

Blood Sugar Level and Rate of Sugar Utilization.—Soskin and Levine compared the relation of the blood sugar level to the utilization of sugar in normal and depancreatized dogs respectively. It was found that the completely depancreatized dog, in the absence of insulin, can utilize dextrose at any rate of which the normal animal is capable. In both the normal and the depancreatized dog the rate of dextrose utilization depends on the height of the blood sugar level. Within a certain glycemic range, the depancreatized dog utilizes the sugar at any given blood sugar level than the normal animal at the same level, but the depancreatized dog at its usual glycemic level utilizes as much sugar as the normal dog does, more, at its usual normal blood sugar level. On the 1st day

basis the two supposedly opposing theories of diabetes can be reconciled. The nonutilization theory applies only in a particular restricted sense. The overproduction theory remains as the major component of the new conception. Previous work on the comparative utilization of carbohydrate by the normal and the diabetic organism must be reconsidered with due regard to the foregoing facts.

Anatomical Record, Philadelphia

69 389 518 (Nov.) 1937

- External Genitalia in Three Female Old World Primates. Note. M. F. Ashley Montagu. New York—p. 389.
Preliminary Studies of Hereditary Variation in Axial Skeleton of the Rabbit. P. B. Sawin, Providence. R. I.—p. 407.
Relation of Golgi Material to Secretory Process in Basophilic Cells of Anterior Hypophysis. A. J. Gatz. Minneapolis—p. 429.
*An Early Stage of Human Implantation. J. S. Latta and J. P. Tollman. Omaha—p. 443.
Left Postrenal Inferior Vena Cava Without Transposition of Viscera. Case. F. J. L. Blasingame and C. H. Burge. Galveston, Texas—p. 465.
Relationships of Epithelial Components of Pituitary Gland of Rabbit and Cat. A. B. Dawson, Boston—p. 471.
Cyclic Changes in Lymphatic Nodules. Eleanor A. Conway. Chicago—p. 487.

An Early Stage of Human Implantation—Latta and Tollman state that a specimen of a uterus removed surgically from a sexually active woman sent to the laboratory for pathologic examination was found to contain an ovum in the endometrium in an early stage of development. Careful examination of the implanted tissues revealed no traces of an embryonic disk, amnion or yolk sac. Nevertheless microscopic study indicated that the tissues were well preserved and features of implantation were well shown. In view of the fact that only relatively few ova in the endometrium in such an early stage of development have been described, the authors give an account of the features presented by their specimen.

Annals of Surgery, Philadelphia

106 961 1130 (Dec.) 1937

- Surgical Follow Up. Department of the New York Hospital. B. S. Ray. New York—p. 961.
Abscess of the Tongue. G. P. Grigsby and S. E. Kaplan. Louisville, Ky.—p. 972.
Endobronchial Probing Combined with Serial Selective Bronchography. Fluoroscopically Controlled. A. Goldman and R. Adams. San Francisco—p. 976.
*A Suggested Method for More Rapidly Curing Empyema. H. Koster, L. P. Kasman and J. Rosenblum. Brooklyn—p. 992.
Treatment of Empyema. C. I. Allen. Detroit—p. 1005.
Carcinoma of the Ampulla of Vater. W. A. Cooper. New York—p. 1009.
Mortality Factors in Appendicitis with Perforation. H. P. Totten. Los Angeles—p. 1035.
Squamous Cell Carcinoma of Lower Rectum and Anus. E. L. Keyes, St. Louis—p. 1046.
Rupture of Supraspinatus Tendon. T. W. Davis and J. E. Sullivan. New York—p. 1059.
*Plasma Exudation. Loss of Plasma-like Fluid in Various Conditions Resembling Surgical Shock. Experimental Study. H. N. Harkins and P. H. Harmon. Chicago—p. 1070.
Wound Healing and Neoplasia. Experimental Investigation. A. Brunschwig, D. Tschetter and A. D. Bissell. Chicago—p. 1084.
New Method of Preparing Nonpyrogenic Intravenous Infusion Fluids Based on Removal of Pyrogen by Adsorptive Filtration. Co-Tu. K. L. McCloskey, M. Schrift and A. L. Yates. New York—p. 1089.

Method for Treatment of Empyema—From 1929 to 1934 Koster and his associates treated 118 cases of empyema by open drainage involving rib resection. The patients were operated on under spinal anesthesia and a segment of rib was removed, so that the resulting opening was large enough to admit inspection and digital examination immediately after the cavity was thoroughly emptied by suction. A drainage tube was placed in the cavity and the wound was packed. No irrigations were given. In five cases convalescence was markedly prolonged because complicating factors developed, the average duration for the other 113 cases was forty-five days from the time the drainage was instituted to the time the wound was healed. Since the convalescent period after open drainage remains long, it seemed that hastening the obliteration of the cavity would be the only available means for shortening convalescence. The measures employed consisted of deep breathing exercises, blowing colored liquids from one Woulfe bottle into another, blowing up balloons or other variations of the same idea, all tending to produce forced respiratory movement. There is a rhythmic fall and rise of pressure in the empyemic

cavity coincident with inspiration and expiration, and the lung can be felt to expand with each inspiration. Obliteration of the cavity in a unilateral process might be accelerated by producing the condition of compression of the other lung by artificial pneumothorax. This procedure has been employed in an additional twenty-one cases. From seven to ten days after the termination of the active pneumonic process, closed intercostal drainage is instituted, until which time no diagnostic punctures are made. The wall of the chest is prepared with iodine and alcohol at the dependent portion of the cavity (usually in the posterior axillary line). After infiltration of the wall of the chest with 1 per cent procaine hydrochloride, a small incision is made with a scalpel, and a trocar and cannula (No. 26 French) is plunged into the cavity. The trocar is removed, and a catheter, previously prepared and clamped at one end, is pushed through the cannula into the cavity. The cannula is then removed and a rubber diaphragm cap is passed over the tube down to the wall of the chest. This cap is sealed to the wall of the chest with collodion or rubber cement and reinforced with adhesive strapping. The catheter is also strapped securely to the wall of the chest and subaqueous drainage is provided for with a T tube, one end of which is connected to a reservoir containing 1 per cent diluted solution of sodium hypochlorite. Beginning on the second or third day, the empyemic cavity is irrigated with the solution every three hours night and day. From two to three days after drainage is begun, artificial pneumothorax is instituted on the unaffected side of the chest. After proper preparation, the skin and subcutaneous tissues in the sixth interspace in the midaxillary line are infiltrated with procaine and the pneumothorax needle is introduced into the pleural cavity. Air is then injected, 50 cc at a time, and the intrapleural pressure is noted. Never more than 250 cc is given to children at the first injection, nor is the positive pressure allowed to exceed 3 cm of water at any time. The needle is then quickly withdrawn, the index finger is applied over the puncture wound and it is sealed with cotton and collodion. In forty-eight hours another 250 to 400 cc is administered. Pneumothorax is maintained by successive injections with roentgenographic and fluoroscopic control as the guide until drainage has ceased, the lung is expanded and the empyemic cavity is obliterated. In the adults the average duration of drainage was 212 days and the average duration from the institution of drainage to healing was 255 days. The average duration of healing for the twenty-one cases of adults and children was 206 days. This method is not completely devoid of danger.

Plasma Exudation—In the belief that it would be well to assemble data on the loss of plasma in burns, freezing, bile peritonitis, tissue autolysis in vivo, acute pancreatitis, pneumonia and pulmonary edema, intestinal manipulation, portal and mesenteric obstruction, externally strangulated colostomy loops and release of a constrictor of an extremity under one head, Harkins and Harmon have done so. They make no attempt to prove in each instance that the loss of plasma is the sole or even the chief factor in the resultant death. Toxic products or nervous reactions are always to be considered. Two factors make the exudation of a certain amount of fluid in these conditions of much more serious import than the loss of a similar amount of usually more watery fluid in certain so called internal medical conditions. The first of these is the rapidity of the loss. In all these surgical conditions the loss of plasma-like fluid is of rapid occurrence, taking place in only a few hours. The transudates in ascites, pleural effusion, edema of the extremities, and the like, are usually of a more chronic type and are slower of formation. The second factor is the protein content, which is similar to blood plasma in these conditions but is low in the transudates occurring in ascites, pleural effusion and edema of the extremities. To epitomize, one can easily lose 2 liters of urine in a day but would not adversely part with 2 liters of blood in the same time. There are traumatic conditions of a nature in which the blood vessels are injured to an extent that only, or chiefly, plasma rather than whole blood leaks out. Mechanical injuries in which vessels are cut or ruptured usually lead to loss of whole blood. The ten conditions discussed in which loss of plasma occurs represent a somewhat different type of trauma in which the injury involves especially the capillaries. Burns and freezing represent thermal trauma, while bile peritonitis, tissue autolysis in vivo and acute pancreatitis

may represent chemical trauma. In pneumonia and pulmonary edema the capillary injury may be either chemical or toxic. Intestinal manipulation is a form of mechanical trauma but depends on a continued mild trauma over a prolonged period rather than a sudden rapid gross trauma. In portal and mesenteric obstruction, externally strangulated colostomy loops and release of a constrictor of an extremity the chief factor seems to be capillary damage due to inadequate circulation. It thus seems that trauma of a thermal or chemical nature, mild continued mechanical type or due to inadequate circulation is the sort of trauma especially likely to lead to exudation of plasma-like fluid from the blood stream. In a variety of conditions there is a loss of plasma-like fluid from the blood stream in amounts approaching fatal losses of plasma in plasmapheresis experiments. The fact that usually the loss of plasma in the shocklike conditions is a little less in all instances than in shock due to plasmapheresis is suggestive of additional factors. In these various conditions the relative importance of loss of plasma as a lethal factor varies considerably. Loss of plasma-like fluid seems to be much greater in fatal experimental bile peritonitis than in the closely related peritonitis due to intraperitoneal implantation of autoclaved liver.

Georgia Medical Association Journal, Atlanta

26 527 568 (Nov.) 1937

- *The Tuberculosis Situation in the State with Reference to the State Sanatorium D T Rankin Alto—p 527
- Diagnosis of Pulmonary Tuberculosis F C Wheelchel Alto—p 529
- Some Medical Aspects of Pulmonary Tuberculosis H E Crow Alto—p 531
- Indications for Surgical Treatment of Pulmonary Tuberculosis D C Elkin and C W Strickler Jr Atlanta—p 534
- Surgical Treatment of Tuberculosis C D Wheelchel Gainesville—p 541
- Comparative Study of Pneumothorax Treatments in White and Negro Races A W Hobby Atlanta—p 542
- Medicine in Mielstrom R H Chaney Augusta—p 551
- Wake Up and Give M M McCord Rome—p 552

Tuberculosis and the State Sanatorium—Rankin believes that for every patient treated in the sanatorium ten are walking the streets and spreading the infection. The state department of health with its traveling clinic is endeavoring to find all the tuberculous cases in the state and especially the early ones. It is trying to educate the people to make them tuberculosis conscious. Some of the counties have established sanatoriums and others have built portable shacks so that the patients may at least be isolated. The state tuberculosis society is running a sanatorium, is conducting a program of education and is helping furnish money for treatment to needy patients. The state sanatorium is rendering patients sputum negative and is training them how to live so as not to menace those with whom they come in contact. But too many unnecessary cases are developing. In other words, most of the results show not in prevention but in improvement and arrests of active cases. There is no way to force a person suspected of having tuberculosis to be examined or one known to have the disease to be treated. Vaccination is required against smallpox, diphtheria and typhoid, quarantine for cases of smallpox, diphtheria and other contagious diseases and isolation for leprosy, but for the disease that is far more contagious than leprosy, that kills nearly as many as typhoid, that takes years, not weeks, to recover from and even if arrested almost inevitably leaves the patient crippled so far as leading a normal, active, energetic life is concerned it is left strictly up to the pleasure and intelligence, or lack of it, of the patient himself as to what precautions, if any, he will take for the protection of his fellow man, or whether he will take treatment or not, few appear to care, and little if anything is done about it. Before much headway can be made to cut down the morbidity of tuberculosis, some plan must be worked out whereby persons with the open active type can be isolated for as long a time as they are liable to spread the disease.

Indiana State Medical Assn Journal, Indianapolis

30 539 616 (Nov.) 1937

- Anesthetic Agents and Methods Useful in General Practice J S Tandy Rochester Minn—p 562
- Röntgenology as an Aid to Diagnosis of Lesions in the Upper Right Abdomen B H Nichols Cleveland—p 563
- Inflammatory Diseases of the Small Intestines (So-Called Regional Ileitis) B D Rosenak Indianapolis—p 568
- Remuneration P H Weeks Michigan City—p 573
- Efficiency of the Eyes C J Rudolph South Bend—p 574

Iowa State Medical Society Journal, Des Moines

27 561 608 (Nov.) 1937

- Avoidance of Permanent Colonic Stoma in Surgery of the Colon C F Dixon, Rochester Minn—p 561
- What We Should Expect from Transurethral Prostatic Resection W A Hicks Sioux City—p 563
- Treatment of Trachoma J H Allen Iowa City—p 568
- Barbiturate Therapy and Cataract Surgery in Parkinsonism V J Blaess, Marshalltown—p 571
- Relation of Gallbladder Disease to Certain Heart Conditions J B Thornton Lansing—p 573
- Preoperative and Postoperative Care J E Brinkman Waterloo—p 577

Journal of Biological Chemistry, Baltimore

121 373 820 (Nov.) 1937 Partial Index

- Relation of Cystine and Methionine to Growth Madelyn Weir K S Kemmerer and W C Rose Urbana Ill—p 403
- *Cause of Sore Mouth in Nephritis S Bliss New Orleans—p 41
- Production of Bacterial Enzymes Capable of Decomposing Creatine R Dubos and B F Miller New York—p 429
- Studies on Presence of Creatinine in Human Blood B F Miller and R Dubos New York—p 447
- Determination by a Specific Enzymatic Method of Creatinine Content of Blood and Urine from Normal and Nephritic Individuals B F Miller and R Dubos New York—p 457
- Effect of Supplementary Methionine and Cystine on Production of Fatty Livers by Diet Helen F Tucker and H C Eckstein—p 459
- Effects of Anterior Pituitary Growth Preparation on Protein Metabolism O H Gaebler and W H Price Detroit—p 491
- Rate of Change of Alkali Reserve After Ingestion of Salts of Organic Compounds II Rate of Change of Alkali Reserve After Ingestion of Sodium Citrate and Sodium Bicarbonate Jane Cape and E L Sevringhaus Madison Wis—p 549
- Chemistry of Lipids of Tubercle Bacilli LI Concerning Firmly Fixed Lipids of Human Tubercle Bacillus R J Anderson R E Reeves and F H Stodola New Haven Conn—p 649
- Id LII Composition of Acetone Soluble Fat of Bacillus Leric R J Anderson R E Reeves and J A Crowder New Haven Conn—p 669
- Studies on Serum Phosphatase Activity Parts I to V S J Thalhauer, M Reichel, J F Gratant and S J Maddock Boston—p 697
- The Milk Clotting Action of Papain A K Balls and S R Heston Washington D C—p 737

Cause of Sore Mouth in Nephritis—It seems that the severe ulceration of cheeks and tongue seen frequently in nephritic patients and nephrectomized dogs may be due to local irritation by ammonia. Bliss has found that tartar from the teeth of dogs contains urease. It is his opinion that ammonia is formed by the action of urease on the urea in saliva. Dogs with normal blood nonprotein nitrogen values do not have ulceration of the tongue and cheeks even though the teeth are coated with tartar. The ulceration of cheeks and tongue in his nephrectomized dogs is in just those locations at which the tissues lie against the teeth. Ulcerations clear up when tartar is removed from the teeth even though the blood nonprotein nitrogen remains elevated. Tartar scraped from the teeth of normal and nephritic dogs hydrolyzes urea solution to ammonia in a few minutes, just as urease does. It was demonstrated that ammonia does actually damage such tissues.

Journal of Immunology, Baltimore

33 337 418 (Nov.) 1937

- Nonspecificity of Flocculative Phase of Serologic Aggregation Hooker and W C Boyd Boston—p 337
- Immunogenetic Studies of Species and of Species Hybrids in Drosophila Separation of Species Specific Substances in Second Backcrosses Irwin and L J Cole Milwaukee—p 355
- Comparative Titrations of Antimeningococcus Serums Produced by Living Cells and with Broth Filtrates Mary B Kirkbride and M Cohen Albany N Y—p 375
- Fractions of the Human Group Specific A Antigen K M Whitcomb and C A Stuart Providence R I—p 393
- *Effect of Sulfanilamide (Para Aminobenzenesulfonamide) on Group C Hemolytic Streptococcal Infections C V Seastone Princeton N J—p 403
- Anaphylaxis with Tobacco Mosaic Virus Protein and Hemolytic Streptococcus C V Seastone H S Loring and K S Chester Princeton N J—p 407

Sulfanilamide and Streptococcal Infections—Seastone discusses the effect of sulfanilamide on guinea pigs infected with hemolytic streptococci belonging to Lancefield's group C. Two strains were used, both of which were isolated from naturally occurring disease in guinea pigs. Strain A was isolated from the chronic lymphadenitis known as "lumpy skin" and strain B was isolated from a colony of guinea pigs infected with the chronic disease. Sixteen guinea pigs were each given 5 000 000 organisms of the chronic strain A intradermally.

the left flank. They were divided into four groups. The first received no treatment, the second was treated immediately, the third and fourth were treated one and two weeks respectively after the inoculation. Treatment consisted in the oral administration of 50 mg of sulfanilamide twice daily. It was discontinued on the thirtieth day of the disease. The animals receiving immediate treatment failed to develop any signs of disease during a period of forty days thereafter. However, about fifty days after the inoculation, two of the four began to show enlargement of the inguinal lymph nodes on the left, and sixty days after the inoculation these were well developed. The animals were killed and hemolytic streptococci were isolated from these abscesses. The course of the disease in the guinea pigs treated one and two weeks after inoculation was indistinguishable from that of the controls which had received no treatment. The intradermal injection of only a few (from ten to 100) organisms of the virulent strain B caused a local abscess in two or three days with surrounding redness and edema. The regional lymph glands were slightly enlarged and soft and the temperature was elevated. The abscess and enlargement of the lymph nodes progressed and the animal died in from five to ten days. The heart's blood culture was almost invariably positive. Control animals, which showed the characteristic elevation in temperature, died in from six to twelve days. The treated animals developed no significant febrile reactions, although for a few days after inoculation a slight induration and redness was present at the site of injection. This rapidly regressed. No enlargement of the lymph nodes occurred. Twenty-two days after the first inoculation the same dose of organisms was given, treatment being withheld. All the animals succumbed. Another group of four guinea pigs was inoculated three times with this lethal dose of organisms, the infection being prevented each time by means of sulfanilamide. Then each of the four guinea pigs received about 300 streptococci intradermally, treatment being withheld. The three animals which had shown no sign of chronic disease died in from five to seven days with hemolytic streptococci in the heart's blood. The remaining chronically infected guinea pig survived.

Journal of Urology, Baltimore

38 421 508 (Nov.) 1937

- Some Observations on Renal Capsule. H. C. Rolnick. Chicago—p. 421.
Bilateral Renal Ectopia. E. K. Morgan and C. M. Stone. Brooklyn—p. 427.
Bilharziasis of Ureter and Its Pathognomonic Roentgenographic Appearance. V. Vermooten. Johannesburg. South Africa—p. 430.
Ureteral Anomalies with Especial Reference to Partial Duplications with One Branch Ending Blindly. Report of Two Cases with Renal Obstruction Cured by Surgical Resection. A. Harris. Brooklyn—p. 442.
Scrotal Hernia of Ureter Associated with Unilateral Fused Kidney. Case Report. R. L. Dourmashkin. New York—p. 455.
*Successful Radical Perineal Resection of Bladder Neck for Carcinoma. C. L. Deming. New Haven. Conn.—p. 468.
Traumatic Injuries of Bladder. Report of Twenty Seven Patients Operated on. A. R. Stevens and W. R. Delzell. New York—p. 475.
*Tertiary Prostatic Hypertrophy. Unusual Case Report. C. A. W. Uhle. Philadelphia and P. D. Melvin. Miami. Fla.—p. 487.
Leukemic Infiltration of the Prostate. M. Jacobi. C. E. Panoff and J. Herzlich. Brooklyn—p. 494.
Fibrolipoma of the Penis. Case Report and Review of Literature. J. T. Gernon and C. M. McKenna. Chicago—p. 500.
A Urethral Meatoscope. R. J. Hubbell. Kalamazoo. Mich.—p. 503.
Ruhdam. New Packing for Use After Enucleation of the Prostate. J. A. Hyams. New York—p. 504.

Resection of Neck of Bladder for Carcinoma—Deming believes that radical perineal resection for carcinoma of the neck of the bladder should be added to the surgeon's armamentarium. This method of surgical treatment may be used in a limited number of cases and has certain advantages over other forms of treatment. Immediate relief is given to the patient. He does not have a long period of spasm of the trigon or neck of the bladder. Dysuria is a negligible factor. The preservation of the external sphincter gives complete control of urination, with a normal maintenance of the capacity of the bladder. A patient with cancer of the neck of the bladder treated with radical perineal excision of the neck of the bladder, part of the trigon, prostate and seminal vesicles is reported well after a six year period. Restoration of normal urination was secured. The comfort of the patient after this operation was extraordinary as compared with the long period of dysuria usually seen after radium treatment.

Tertiary Prostatic Hypertrophy—It is the impression of many that recurrence of benign prostatic hypertrophy, following a previous suprapubic or perineal operation, is unique. That this assumption is fallacious is evidenced by the statements of men who have had wide clinical experience in prostatic work. However, two recurrences are uncommon and for its unusual interest Uhle and Melvin cite the history of their patient who was subjected to four operative procedures (during a period of nine years and four months) for the relief of prostatic obstruction. The frequency of recurrence, according to several investigators, varies between 1 and 2 per cent. The surgical pathology of benign prostatic enlargement precludes the fact that the prostate is removed at operation. Adenomatous tissue is enucleated. The adenomas, during their period of growth, expand and compress prostatic tissue into a thin shell resembling a capsule. With pressure removed, the prostatic tissue either remains atrophic or regenerates to resume its normal size once again. Therefore it seems logical to assume that the same etiologic factor or factors causing the original growth may also explain the recurrence of prostatic hypertrophy. Another factor in recurrence, and one receiving theoretical consideration from various authors, is the failure to notice or the incomplete removal of small spheroids of adenomatous tissue at the first operation. If the blood supply is not injured, these small spheroids are capable of regeneration to the degree of interfering with the dynamics of micturition.

Medical Annals of District of Columbia, Washington

G 305 336 (Nov.) 1937

- Present Status of Tuberculosis in the District of Columbia. G. C. Ruhland and C. C. Dauer. Washington—p. 305.
Medical Uses of Ergotamine Tartrate. H. H. Hussey. Washington—p. 309.
Value of Combining Sedation of the Central and Autonomic Nervous Systems in Treatment of Epilepsy. J. W. Watts. Washington and G. A. Schwarz. New York—p. 315.
Methods of Diagnosis of Female Endocrinopathies. J. Kotz and Elizabeth Parker. Washington—p. 321.
New Type of Trepaine Burr for Simplifying Neurosurgical Technique. J. J. Shugrue. Washington—p. 328.

Pennsylvania Medical Journal, Harrisburg

41 79 176 (Nov.) 1937

- *Peptic Ulcer. F. H. Lahey. Boston—p. 79.
Acute Osteomyelitis in Children. R. L. Ellis. York—p. 86.
Meddlesome Obstetrics. R. G. Emery. Washington—p. 88.
The General Practitioner and the Neurotic Child. R. H. Israel. Warren—p. 91.
The Fad of Alkalization and Its Relation to Renal Lithiasis. W. J. Erickson. Philadelphia—p. 94.
Malignancy of the Lung. H. W. Bernhardt. Rochester—p. 96.

Peptic Ulcer—On the basis of an analysis of 3,000 cases of peptic ulcer treated at the Lahey Clinic, Lahey concludes that all peptic ulcers, except those which are true surgical emergencies, are best submitted to the gastro-enterologist for investigation and a primary trial of management. The surgical indications are largely those related to failure under medical management, such as persistence of pain, perforation, pyloric obstruction, hemorrhage and a suggestion of a malignant condition in an ulcerating lesion. Gastro enterostomy is no longer justifiable as a routine method of treating peptic ulcer surgically. Subtotal gastrectomy is the operation that is followed by the highest percentage of patients having low gastric acid values, by the lowest incidence of gastrojejunal ulcer and with the fewest digestive difficulties. Subtotal gastrectomy is not to be applied unreservedly to all patients with ulcer.

Southwestern Medicine, Phoenix, Ariz

21 377 424 (Nov.) 1937

- The British Social Security Act with Especial Reference to the Panel System. R. J. Stroud. Tempe. Ariz—p. 377.
Importance of Early Recognition of Biliary Tract Affections. E. A. Campbell. Albuquerque. N. M.—p. 379.
Congenital and Acquired Vesical Neck Obstruction in Male Children. H. T. Low. Pueblo. Colo.—p. 381.
Eye Injuries from Foreign Bodies. W. J. Smith. Phoenix. Ariz—p. 384.
Torsion of the Testicle. K. D. Lynch and R. F. Thompson. El Paso. Texas—p. 388.
Gastro-Intestinal Dysfunction. B. A. Rhinehart. Little Rock. Ark.—p. 391.
Syphilitic Ulcer and Carcinoma of the Stomach. Case. F. J. Milloy. Phoenix. Ariz—p. 398.
Medical Annals of Arizona. Carlos Montezuma. M.D. O. H. Brown. Phoenix. Ariz—p. 400.
The Last Days of Carlos Montezuma. M.D. R. J. Stroud. Tempe. Ariz—p. 404.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

49 465 526 (Nov.) 1937

Studies of Photosensitization by Porphyrins H F Blum and N Pace —p 465

Lipstick Dermatitis. Report of Case Due to Eosin F F Hellier —p 485

*Occurrence in Humans of Contagious Pustular Dermatitis of Sheep (Orf) G A G Peterkin —p 492

Contagious Pustular Dermatitis —Peterkin reports five cases of contagious pustular dermatitis of sheep ('orf') in human beings. The only difference that he observed between the lesions produced in animals experimentally and those found in human beings is that there seems to be in the human being a tendency for the lesions to be umbilicated. The progress of the disease seems to run the following course. The first lesion to appear is a dark red papule, which grows to any size from threepence to half a crown. This is quite hard and as a rule painless. Gradually the papule begins to resemble a huge red molluscum contagiosum tumor, with a marked umbilication. This depressed center is covered with thin white skin and contains clear exudate. This exudate gradually becomes purulent, probably owing to secondary infection, and granulations soon heap up. This stage is often painful. If the tumor is dressed with antiseptics, it tends to shrivel up in a few weeks, without any purulent discharge or granulations appearing.

British Journal of Radiology, London

10 765 828 (Nov.) 1937

*Place of X-Rays in Treatment of Certain Forms of Chronic Arthritis F Herniman Johnson —p 765

Radiating Surfaces J van Rooijen —p 781

Brachymesophalangy and Syndactyly in a Telegu J H Barrett —p 817

X-Rays in Treatment of Chronic Arthritis —Herniman-Johnson discusses those forms of arthritis in which X-rays should be given a trial. Hypertrophic noninfective osteoarthritis (monarticular) is amenable to roentgen therapy, provided no predisposing factors are left out of account. Patients should never be rejected because roentgenograms reveal an advanced state of disease. Functional disability alone should not cause one to take a hopeless view. Actual ankylosis will defeat any efforts to restore function except by surgical means, but ankylosis is comparatively rare and it is doubtful whether it can occur in true hypertrophic arthritis. Failure to benefit by roentgen treatment in hypertrophic noninfective arthritis may occur for no discoverable reason, but some common causes of failure are an increasing obesity, static deformity, lack of active exercises and passive movements and focal infection. Infective arthritis (monarticular), when first seen in its chronic stage, is to be differentiated from the noninfective form rather by the history than by the X-ray appearances. The X-ray picture may be indistinguishable from that of hypertrophic arthritis, or it may show greater loss of cartilage, rougher joint margins and less osteophytic formation than is usual in the noninfective form. The treatment of these cases is more difficult than is that of the noninfective monarticular arthritis. If X-rays are used, the dosage must be very carefully graded according to the amount of active inflammation present. In the chronic stages, dosage may be used as in the hypertrophic form. Temporary improvement is perhaps the rule but genuine arrest is hard to attain. Many of these joints ultimately have to be excised, with a view either to the making of a false joint or to the production of a bony ankylosis. There is little doubt that the lumping together of such cases with those of the noninfective form merely because the late X-ray appearances are similar, has been detrimental to a proper appreciation of the beneficial effects of roentgen treatment. An analysis of the author's series of eighty cases of noninfective arthritis treated showed 25 per cent functionally cured, 40 per cent greatly improved and the remainder only slightly or not at all, benefited. In hypertrophic noninfective osteoarthritis, 150 roentgens is given to the affected joint twice a week for three weeks (first series). If some lessening of pain results the same treatment is continued for a further three weeks. If no relief occurs the dosage in the second series of six treatments may be increased to 300 roentgens per sitting,

180 kilovolts, 0.5 of copper filter, 40 cm focus skin distance and a field of from 25 to 30 cm in diameter, anteroposterior and lateral areas are used. Such treatment seldom produces any constitutional disturbance unless arthritis of the spine is concerned. In the latter case the field should be reduced to from 10 to 12 cm in the long axis of the body. If the patient complains of general discomfort. As to further treatment, at least two more full courses of twelve sittings should be given at intervals of three months, no matter how well the patient feels, and thereafter less frequently for from two to three years. If improvement at the end of six weeks is small or absent, it is desirable to persist. X-rays applied locally to individual joints in rheumatoid arthritis (polyarthritis) may give some temporary relief, but the progress of the disease is not checked. The malady is essentially constitutional, and if it is ever to be dealt with successfully, it must be by some form of constitutional treatment.

Glasgow Medical Journal

10 193 244 (Nov.) 1937

The Chemistry of Bacterial Action in Relation to Enzyme Activity: I Human Pathogenicity J W Chambers and R D Stuart —p 193

The Mechanism of Headache J E Paterson —p 210

Journal of Mental Science, London

83 489 608 (Sept.) 1937

Some Observations on the Care of the Insane D McRae —p 489

Some Remarks on Physiology of Cerebral Circulation F L Golla —p 505

Cerebral Ischemia and Mental Disorder F A Pickworth —p 517

Circulatory Factor in Pathogenesis of Mental Disorder E Krapf —p 534

Psychologic Implications of Functional Circulatory Disorder E Guttmann —p 542

Psychoses Associated with Hypertension Arteriosclerosis and Heart Failure W Mayer Gross —p 551

Lancet, London

2 1061 1118 (Nov. 6) 1937

Orthopedic Surgery Retrospect and Forecast W R Bristow —p 1061

*Chemotherapy of Streptococcal Infections Particularly Streptococcal Tonsillitis A Smith —p 1064

*Heart Block in Coronary Thrombosis J D O Kerr —p 1066

Pentothal Sodium in Intravenous Anesthesia F B Mallinson —p 1070

Chemotherapy of Streptococcal Infections —Smith has used sulfanilamide and similar preparations in the treatment of two cases of hemolytic streptococcal arthritis of the hip joint, thirty-nine cases of streptococcal tonsillitis among inpatients and the staff, and six cases of streptococcal cervical adenitis and cellulitis in outpatients who had had tonsillitis. The *p*-aminophenylsulfonamide and *p*-benzylaminobenzenesulfonamide were equally valuable in the treatment of streptococcal tonsillitis, but the latter was somewhat less toxic. Larger doses than those usually advised were found advantageous. The combined administration of sulfanilamide and serum was found useful. The sulfonamides had no prophylactic value in checking the spread of tonsillitis under epidemic conditions. Infection by the hemolytic streptococcus was more amenable to treatment by the sulfonamides than infection by *Streptococcus viridans*.

Heart Block in Coronary Thrombosis —Kerr presents a review of previous reports of heart block in coronary thrombosis. In the 1,436 reported cases of coronary thrombosis the average incidence of heart block proved to be 7.4 per cent. Among the case records of the cardiac department of the London Hospital and others from a consulting practice there were thirteen cases of coronary thrombosis complicated by heart block. In these thirteen patients heart block first appeared under observation during the clinical course of coronary thrombosis. Four had a slight degree of a prolonged PR interval, four had partial and five complete heart block. Of good clinical recoveries, with disappearance of the block. Of the partial heart block group, two died within a few weeks and one was untraced. The remaining three died on the Adams-Stokes attack a week after the onset the other two on the Adams-Stokes attack a week after the onset the other two on the Adams-Stokes attack a week after the onset. Coronary thrombosis has to be included among the causes of heart block seen either because of bradycardia or because of clinical symptoms with or without Adams-Stokes attacks. In

any collected series of cases of clinical heart block, those of acute onset from this cause should be considered separately. The conductive tissues may escape completely in an extensive cardiac infarction, while a localized occlusion of the vessels supplying the node and bundle may occur, creating too slight a disturbance to be recognized clinically as a cardiac infarction, though sufficient to produce heart block. Although the prognosis of coronary thrombosis in general is adversely affected by the complication of heart block, clinical recovery and disappearance of the block are by no means uncommon.

Chinese Medical Journal, Peiping

52 479 622 (Oct) 1937

- *The Heart in Severe Anemia C L Tung W N Bien and Y C Chu with collaboration of S H Wang and W S Ma—p 479
Obstetric Criteria in North China II Weights and Measurements of the Mature New Born Child G King and Tang Yu Teh—p 501
Physical Traits of Peiping Children I Stature and Weight Measurement from One Month to Three Years of Age R A Guy, C C Chuang H H Huang and K S Yeh—p 507
Fractures of the Skull Y C Chao and S T Kwan—p 519
Studies in Liver Function of the Chinese W W Cadbury and T Y Ting—p 531
*Insulin Shock Treatment of Schizophrenia Preliminary Report F G Halpern—p 541

The Heart in Severe Anemia—The interest of Tung and his associates on the effect of prolonged, severe anemia on the cardiovascular system was aroused in 1933, when one of them observed marked cardiac enlargement and congestive failure in a patient with Bant's disease and severe hypochromic anemia. They observed ten patients suffering from severe anemia (hemoglobin about 25 Gm, or 17 per cent), without any other discoverable factor that might cause heart disease, for the effects of such anemia on the cardiovascular system, with clinical, x-ray and electrocardiographic studies. In addition, venous pressure by the direct method and the arm to tongue circulation time were determined in most of the cases. Three patients showed marked cardiac enlargement with little or no evidence of congestive failure. Six showed marked cardiac enlargement and marked congestive failure. One had a normal heart. Cardiac enlargement rapidly disappeared with rest and an increase of the hemoglobin toward normal, and the heart assumed normal size and shape when the blood became normal. Diastolic cardiac murmurs encountered in two patients during the height of anemia disappeared when the anemia disappeared. All patients except one had sinus tachycardia and large pulse pressure. Six patients presented physical evidence of marked congestive heart failure including the elevation of venous pressure. The relative duration of electrical systole was prolonged. In spite of elevated venous pressure the circulation time remained normal. It is concluded that marked cardiac enlargement and marked congestive heart failure may result from prolonged, severe anemia alone, particularly in individuals who have extra demands on their circulatory system (physical exertion, fever, pregnancy, parturition). Both cardiac enlargement and cardiac failure in such cases disappear rapidly when the anemia is cured. "Anemic heart" should be considered a clinical entity.

Insulin Shock Treatment of Schizophrenia—Of the schizophrenic patients treated by Halpern by the insulin shock method, only eight have completed the treatment, while others are still under treatment. The patients were unselected and were taken into treatment without regard to the duration and the type of schizophrenia. Although five of the eight cases were chronic, the results are very encouraging. There has been no fatality, although severe collapse and epileptic fits have been encountered which, fortunately, could be stopped in time. Half of the patients have had complete remission, one good remission, one remission with a defect (that is, with social fitness but remaining schizophrenic changes) and two partial improvement but without social fitness. The paranoid form of schizophrenia gave the best response to treatment. Likewise two cases of acute schizophrenia reacted well. Less favorable than the reaction of paranoid and acute schizophrenias to the treatment were the two patients with catatonia, in one of whom a good remission and in the other a remission with residual defect was obtained. Although the duration of the disease was not longer than in the two cases of the paranoid type, the treatment took a much longer time than in paranoid schizophrenia to effect remission.

Journal de Chirurgie, Paris

50 737 892 (Dec) 1937

- *Is Infiltration of Stellate Ganglion Justified in Pulmonary Embolism? R Leriche R Fontaine and L Friedmann—p 737
*Traumatic Serous Meningitis and Encephalic Arachnoiditis P Puech and E Krebs—p 749
Renal Lithiasis of Hypercalcuria M Roux—p 781

Infiltration of Stellate Ganglion in Pulmonary Embolism—Leriche and his associates reach the conclusion that infiltration of the stellate ganglion should be resorted to as quickly as possible in all pulmonary embolisms. The choice of the side is determined by the pain, provided it is distinct, but, if there is no indication of the localization of the embolism, the infiltration should be bilateral. The infiltration of the stellate ganglion is justified by the important part played by the vasomotor reflexes in the mechanism of death. Anatomopathologic studies in 225 cases of fatal pulmonary embolisms revealed that in the majority death is due to massive embolism of the pulmonary artery, either of the trunk itself or of the right and left branches. In these cases, that is, in about two out of three cases, the functional therapy is ineffective. If an embolism appears under conditions in which an embolectomy can be made at once, this intervention can always be tried. However, this requires a fortunate combination of circumstances which are not often found together. In pulmonary embolisms in which the services of surgical specialists are not available, the infiltration of the stellate ganglion is indicated. Always practicable, it is the method capable of counteracting the associated vasomotor disorders which aggravate the mechanical difficulties of the pulmonary circulation. It represents a notable therapeutic progress. Even the embolisms that occur under conditions in which a Trendelenburg operation is considered can probably be benefited by infiltration of the stellate ganglion, performed by the intern on duty, at the appearance of the first alarming signs, while awaiting the arrival of the surgeon. The authors conclude that physicians should master the technique of this method as they do that of the intracardiac injections. All that is required is a syringe of 10 cc capacity, an ampule with a 1 per cent solution of procaine hydrochloride without epinephrine and a needle 10 cm in length.

Traumatic Serous Meningitis and Encephalic Arachnoiditis—Puech and Krebs report that in a series of forty-six cases of cerebral traumatism, which were surgically treated by them, they observed twenty with serous meningitis or traumatic arachnoiditis. In spite of the alarming condition of the injured, they did not have a case of surgical fatality and the patients benefited by the intervention. The authors classify the twenty cases in two groups. In the first group the meningitis develops almost immediately, whereas in the second group it develops later. Each of these groups is again divided into subgroups. Taking up the first main group, the authors give their attention first to the diffuse and then to the localized cases of serous inflammation of the arachnoid and pia mater and then to the cases of internal hydrocephalus. They show that the nature of the intervention is determined chiefly by the trephine puncture. In some of the localized cases of early meningitis a simple trepanation may suffice. In describing some of the case histories, the authors also show illustrations of their surgical interventions. Following a discussion of the different groups of cases, the authors present a general discussion of the diagnosis, the pathologic anatomy and the pathogenesis. Concluding, they once more stress the favorable results that they obtained with their surgical interventions, they operated on some patients who were in complete coma and in whom death seemed only a question of hours. All the patients again became normal or almost normal.

Presse Medicale, Paris

45 1707 1730 (Dec 1) 1937 Partial Index

- Is the Phenomenon of Arthus an Anaphylactic Phenomenon? A Besredka—p 1712
*New Reaction for Study of Lipoids Lipoidemia E Chabrol and R Charonnat—p 1713

New Reaction for Study of Lipoids—Chabrol and Charonnat state that their studies on the phosphovanillin reaction have led them to search for the variants that can be introduced by heating and the addition of sulfuric acid. To bring into evidence cholic acid they, together with Cottet, aimed

at isolating the effects of cholesterol and of fatty acids. It is easy to disclose the latter substances by preceding the phosphovanillin reaction with the action of concentrated sulfuric acid at the temperature of the boiling water bath and, at the end of this treatment, it is the cholic acid which disappears to cede the place to a color reaction, depending on cholesterol, nonsaturated fatty acids (oleic, linoleic), certain alcohols or higher aldehydes. If the cholic acid ceases to interfere in the sulfophosphovanillin reaction, its congener, desoxycholic acid, plays only a small part beside the other substances. The authors adopted the following technic. One tenth cc of the liquid that is to be tested is added to 49 cc of concentrated sulfuric acid (specific gravity 1.84), then follows heating for ten minutes in the boiling water bath. After cooling, 0.4 cc of the mixture is combined with 36 cc of concentrated phosphoric acid (specific gravity 1.71), then 1 cc of an aqueous solution of vanillin (0.6 in 100) is added. A rose tint develops gradually, which can be observed by the colorimetric procedure at the tenth minute, cobalt phosphate being taken as the scale of standards. The authors express the figures in cholesterol, after having fixed the equivalents which it is easy to establish between more or less diluted alcoholic solutions of this substance and the numbers of the color scale. The figures thus obtained correspond not only to the free and esterized cholesterol but also to the nonsaturated fatty acids (oleic and linoleic) which esterize cholesterol or which play a part in the fatty substances and in the lecithins. The authors reemphasize that cholic acid does not produce the reaction but that desoxycholic acid can have a small part. They employed the test in 175 cases. Bile gave strong sulfophosphovanillin reactions. More than 20 Gm of lipoids, expressed as cholesterol, can be detected. The corresponding figures determined by the reaction of Liebermann-Grigaut were between 0.5 and 1.25 Gm per thousand. There exists no proportionality between the results of the latter reaction and the reactions obtained by the sulfophosphovanillin reaction. A tabular report indicates this clearly. The same discrepancies appear if the two tests are made on the blood serum. In view of the fact that considerable differences exist between the results obtained when the subject is fasting and when a fatty meal has been taken, the authors demand that the test be made in the morning, when the patient is still fasting. Extremely strong sulfophosphovanillin reactions of the blood serum were obtained in various clinical conditions. The maximum figure of 12 Gm per thousand was noted in a milky serum which revealed 2.5 Gm of cholesterol by the technic of Grigaut, in which Harispe was able to detect a total lipid content of 24 Gm. The patient in question was one with cholemia without icterus, in whom the liver was enlarged and sensitive. The authors also detected 11.5, 9.8 and 6 Gm per thousand in icteric patients who had diabetes, biliary cirrhosis and pancreatic cancer, respectively. The smallest figures, from 0.75 to 1.25 Gm per thousand, were detected in the more or less cachectic patients with cirrhosis and in the patients who had been weakened by several days of repeated attacks of hepatic colic. In the majority of the examined cases (109 of 161) the figures were between 2 and 4 Gm per thousand. The authors reach the conclusion that the sulfophosphovanillin reaction provides valuable information about the metabolism of the nonsaturated fats and about lipidemia and cholesterolemia.

Jahrbuch für Kinderheilkunde, Basel

150 1932-36 (Nov. 1) 1937

- Investigations on Vitamin C Metabolism in Lactating Women. Degree of Physiologic and Pathologic Saturation of Human Organism with Vitamin C. T. Baumann—p. 193.
*Leukemia in Nurslings. O. Saxl—p. 228.
*T Factor. E. Schiff and C. Hirschberger—p. 247.

Leukemia in Nurslings.—Saxl reports five cases of leukemia in nurslings but says that leukemia is comparatively rare during infancy. One of the cases reported was so called chloroma. The disorder began during the eighth month of life, the patient being one of the youngest known. He suggests that the term chloroma be abandoned and leukemic myelocytoma or leukemic lymphocytoma employed. Another one of the reported cases concerns a nursing in whom an acute leukemia was detected at the age of 4½ months. The mother of this nursing was syphilitic, but the child was free from manifest signs of syphilis. The child died with the symptoms of ileus

caused by invagination of the leukemic infiltrates. Leukemia in a boy, aged 10, likewise terminated in death by ileus. The author further reports a case of myeloid leukemia in a nursing in whom symptoms of the disorder were already evident at the age of 6 weeks. It is probable that syphilis played a part in the pathogenesis of this case. Roentgen irradiation produced a temporary remission in this case. Another of the reported cases was one of myeloid leukemia in a nursing who was under observation from birth. At first this nursing presented signs of anemia and the subleukemic blood picture developed gradually. In antithesis to these cases the author presents a case of Jaksch-Hayem's pseudoleukemia which, after prolonged hospitalization, presented a leukemoid blood picture. This case demonstrates the difficulty of the differentiation between true leukemia and pseudoleukemia.

T Factor in Sesame Oil.—Schiff and Hirschberger investigated the increase in the number of thrombocytes under the influence of medication with the T factor. Vehicles of the T factor were either pure sesame oil or vitamin A in sesame oil. Investigations were made on twenty children and sixty-three rats. The observations indicated that sesame oil may be considered as having an adequate amount of the T factor if the daily administration of two drops to young rats (30 Gm) or of twenty drops to healthy children produces, in three or four weeks, a doubling or a considerable augmentation of the number of platelets. The author says that as regards the thrombocytosis there is no difference between the two oils. The fact that the sesame oil containing the vitamin A (vogan oil) caused no greater increase in the number of thrombocytes and the fact that olive oil, which contains the same amount of vitamin A as does the vogan oil, exerted no influence whatever on the number of thrombocytes indicate that not the vitamin A causes the thrombocytosis but rather the T factor, which is found in sesame oil.

Giornale di Batteriologia e Immunologia, Torino

19 433 576 (Oct.) 1937 Partial Index

- Researches and Observations on Amount of Bacteria in Pasteurized and Unpasteurized Butter. F. E. Perini—p. 433.
Researches on Pathogenicity of *Bacillus Mesentericus Vulgatus*. A. D'Agata—p. 471.
Bactericidal and Bacteriostatic Properties of Phenylmercuric Nitrate. U. di Aichelburg—p. 479.
Therapeutic Uses of Cod Liver Oil Ointment. E. Caserio—p. 51.
Nakagawa Takasugi and Sato Test in Cancer. L. Montagnani—p. 57.
*Influence of Short Waves on Pathogenic Bacteria. T. Ozzano and C. Re—p. 535.

Influence of Short Wave Irradiation on Bacteria.—Ozzano and Re prepared two series of tubes which contained suspensions of several species of pathogenic bacteria. The tubes for the experiment were submitted to irradiations with wave 4.3 and 7.36 meters long, for thirty minutes. The controls were left in the incubator at a constant temperature of 98.6 F. Immediately after the irradiation, smear cultures were made with the experimental and control suspensions. After the preparation of smear cultures the experimental and control tubes were left in the incubator and the experiment was repeated one, four, six, twelve and fifteen hours after the first irradiation. The results as to the development and changes observed in the smear culture suspensions twenty-four or thirty-six hours after they were prepared. In general the results were the same for the two bacterial suspensions. The irradiations sometimes stimulated and sometimes inhibited the development of bacteria. The effect was transient because of the extraordinary capacity of bacteria to regenerate. According to the authors, short wave irradiations have no selective specific action on bacteria. They act in an abiotic way by increasing the temperature of the environment of bacteria.

Pediatria, Naples

45 1053 1106 (Dec. 1) 1937

- Infant Mortality in Naples from 1931 to 1935. G. Piumazzo—p. 1.
*Lymphocyte Monocyte Index in Pulmonary Tuberculosis in Children. G. Murano—p. 1066.
Favism in Rome. Five Cases Recently Observed with Especial Reference to Treatment. I. Biddau—p. 1086.

Lymphocyte-Monocyte Ratio in Pulmonary Tuberculosis.—According to Murano the lymphocyte monocyte ratio in the blood of normal children diminishes as children grow. It varies between 5.5 and 6.2 between the ages of 2 and 3 years.

between 36 and 5 between the ages of 4 and 9 years and between 3 and 5 in older children. The author made determinations of the variations of the ratio in the blood of forty-five children between the ages of 2 and 11 years who were suffering from pulmonary tuberculosis. The ratio varies in relation to the clinical form of pulmonary tuberculosis and the seriousness of the tuberculous lesion. It is increased in biliary and tracheobronchial adenopathies which are associated with toxemia and in epituberculous and perifocal regressive infiltrations. It is diminished in infiltrations of the lobar type (the so called lobitis) and in ulcerocaseous and miliary forms of pulmonary tuberculosis. Whereas the increase of the ratio depends on the presence of lymphocytosis, which originates in defensive reactions of the body, its decrease depends on the presence of monocytosis and lymphopenia. The lymphocyte-monocyte ratio is of diagnostic value, in relation to the clinical form, evolution and intensity of pulmonary tuberculosis in children. However, it has no prognostic value.

Klinische Wochenschrift, Berlin

16 1593 1632 (Nov. 13) 1937 Partial Index

- Clinical Significance of B Avitaminoses A Meyer—p 1593
Chemotherapy in Connection with Problem of Carcinoma M Oesterlin—p 1598
Roentgenologic Aspects of Perforations of Digestive Tract B W Ercklentz—p 1606
Type Distribution of Extrapulmonary Pneumococcal Diseases B Kemkes—p 1609
Treatment of Bronchopneumonia Patients with Neosarsphenamine B Ebenius—p 1611
*Calcium Therapy of Lead Poisoning H Taeger—p 1613
*Clinical Experiences with "Citrin" (Vitamin P) S Lajos—p 1615

Calcium Therapy in Lead Poisoning—Taeger follows a review of the literature on calcium therapy of lead poisoning with a critical evaluation of this therapy. He shows that all interventions in the process of lead poisoning be they measures to mobilize lead (potassium iodide, acidification or alkalization) or the administration of calcium, result in the mobilization of lead. For this reason, extreme caution is necessary in the therapy of lead poisoning. He too observed calcium deficiency in the erythrocytes of patients with lead poisoning and thinks that, in order to reestablish normal conditions, the administration of calcium is necessary but that it must be done with great caution. The most essential point in the treatment of lead poisoning is to prevent a further resorption of lead. In case of severe symptoms of intoxication (colics, paralysis and so on) all measures that mobilize lead are strictly contraindicated. After the first acute signs of intoxication have disappeared, calcium should be given in order to compensate for the calcium deficiency. However, the calcium should not be given in large doses. Milk, which contains calcium and phosphates in a suitable ratio, should be given in gradually increasing quantities. The daily quantity of milk should not exceed 1 liter. Later, a small amount of calcium gluconate may be given by mouth. Large doses, as well as the intravenous administration of calcium, are to be avoided.

Experience with Vitamin P—Lajos points out that Szent-Gyorgyi and his collaborators isolated from lemons a crystalline substance which they designated as "citrin". Since these investigators demonstrated that the administration of citrin exerts a favorable effect on the resistance and permeability of the capillaries in cases of vascular purpura, they applied to "citrin" the term of permeability vitamin or vitamin P. This substance is a mixture of the glucosides that belong to the group of the flavones. The author reports his therapeutic experiences with vitamin P (citrin). He says that vitamin P is a strongly active pharmacologic substance of great therapeutic value. It increases the capillary resistance and decreases the permeability of the vessels. It is valuable in the treatment not only of vascular purpura but also of hemorrhagic nephritides of different origins. In the latter conditions it quickly arrests the hematuria and also improves the general condition. The author thinks that vitamin P might be of prophylactic value in disorders in which there is danger of nephritis. In other disorders that are accompanied by hemorrhages the administration of vitamin P does not effect such a noticeable improvement in the clinical picture, although there may be an increase in the capillary resistance and a reduction in the permeability of the vessels.

Zeitschrift für Krebsforschung, Berlin

46 313 378 (Sept 30) 1937

- *Investigations on Cancer Metastases H E Walther—p 313
Carcinogenic Action of 12 Benzpyrene J Klinke—p 334
Immunization Experiments with Brown Pearce's Rabbit Tumor W Raab—p 343
Growth and Differentiation of Carcinoma of Lactiferous Duct in Mamm Tumor and Metastasis H Dabelstein—p 355
Acquired Resistance of Lung of Rat Against Metastases of Jensen Sarcoma E Schairer—p 364

Cancer Metastases—According to Walther, the hematogenic route is the deciding factor in the dissemination of cancer. In this respect there are only differences in degree between the connective tissue tumors and the epithelial tumors. Depending on the position in the circulatory system, the organs are classified into four groups, and accordingly there are four types of metastatization: (1) the pulmonary type, (2) the hepatic type, (3) the portal vein type and (4) the vena cava type. These four types are characterized not only by the type of hematogenic dissemination but also by the susceptibility to metastases. The capillary regions of the organism, depending on their position in the circulatory system, represent filters of the first, second or third class for the hematogenic dissemination. Whereas the topography of the dissemination is dependent on the aforementioned types of metastatization, the quantitative character of the metastatization (density of dissemination) is determined by the specific characters of the cancer cells and the structure of the tumor. The author thinks that there are no convincing proofs for the occurrence of a true retrograde dissemination. He thinks that a large number of the cases with alleged retrograde lymph node metastases are cases of continuous dissemination. On the basis of his experiences, he concludes that this generally unsatisfactory hypothesis can be abandoned. In the majority of cases he was able to demonstrate that diseased lymph nodes which are not in the region of the primary tumor were regional metastases of an organ that had become involved by the hematogenic route. Whereas a retrograde transport in the lymph vessels appears improbable for purely anatomic reasons, the possibility of a temporary reversion of the venous blood stream must be conceded, but even this theoretical possibility is of only slight practical significance.

Zentralblatt für Gynäkologie, Leipzig

61 2369 2416 (Oct 9) 1937

- Unilateral Removal of Ovaries and Its Sequels P Caffier—p 2370
*After Treatment of Menopausal Hemorrhages with Roentgen and Radium Rays W von Massenbach—p 2377
Significance of Decidual Transformation of Uterine Mucosa for Diagnosis of Extra Uterine Pregnancy H Schneider—p 2381
Lactation and Vitamin C E Werner—p 2388
Influence of Estrogenic Hormone on Lactogenic Action of Anterior Lobe of Hypophysis of Lactating Rats M Wiegand—p 2391

Radiologic Treatment of Menopausal Hemorrhages—Von Massenbach reports experiences with roentgen and radium irradiations on women of the menopausal age who were admitted to the clinic on account of hypermenorrhea. He discusses the principles according to which the method of treatment was decided, the dosage of the radium and roentgen irradiations and the results of the treatment. He says that, if curettage revealed a cystic glandular hyperplasia of the uterine mucosa, irradiation was done, provided the woman was past the age of 40. However, if there was only hypermenorrhea and slight or no cystic hyperplasia, irradiation was resorted to only if the woman was more than 45 years old. Regarding the dosage, the author says that amenorrhea is produced by applying to the ovary from 1,800 to 2,000 mg radium element hours, or 290 roentgens. Treatment with radium is given the preference in patients who have suffered severe loss of blood, because it is most reliable in effecting arrest of the hemorrhage. Roentgen treatment was employed in women in whom an inflammatory process could not be definitely excluded or in whom there existed deformities of the uterine cavity. In comparing roentgen and radium treatment as regards the after-effects, it was found that the former working capacity was reestablished in more than two thirds of the women who had undergone radium treatment but in only about half of the women who had received roentgen treatment. In view of the superiority of the radium treatment in this respect it was used chiefly in women of the constitutional

type that is subject to symptoms of abolished function, provided of course that inflammatory processes of the adnexa and deformities of the internal surface of the uterus could be excluded

Wiener Archiv für innere Medizin, Vienna

31 169 230 (Oct. 31) 1937

- Cardiocostal Zones S Wassermann —p 169
Genesis of Genopathic Syndrome Bardet Biedl Acrocephalosyndactylia I L Pool —p 187
Intravenous Scilla Therapy L Zwillinger —p 201
Diabetes and Vitamin C R Pfeleger and F Scholl —p 219

Diabetes and Vitamin C—Pfeleger and Scholl decided to determine how saturation with vitamin C affects the vitamin C metabolism of the carbohydrate metabolism of patients with diabetes mellitus. They accepted elimination in the urine as a measure of complete saturation. They determined the vitamin C deficit by means of the saturation method of Harris. They detected a hypovitaminosis in most diabetic patients in some the deficit was as high as 2,500 mg. After the normal biologic status had been attained, attempts were made to influence the carbohydrate metabolism. In diabetic patients who were not treated with insulin the cevitic acid exerted no influence on the sugar content of the blood and urine, but the combustion of the acetone bodies was favorably influenced. After saturation with vitamin C, the action of insulin was noticeably intensified by cevitic acid, so that the carbohydrate metabolism of the diabetic patients could be regulated with smaller amounts of insulin. In persons without diabetes, saturation with vitamin C did not influence the fasting blood sugar or the blood sugar after tolerance tests. The sugar curves that were obtained after the administration of insulin revealed a noticeable intensification of the insulin effect following saturation with vitamin C. The same effect, although in a milder degree, could be determined in diabetic patients. As explanation of the increased responsiveness to insulin on the part of the organism that is saturated with vitamin C, the authors assume that the cevitic acid produces an increase in the capacity of liver to assimilate glycogen, or an increase in the tissue metabolism either directly or by activating the insulin. In all diabetic patients, irrespective of the modification of the sugar metabolism, cevitic acid improves the general condition, the fatigue disappears, the patient feels fresher and the vitality is increased. The authors direct attention to the vitamin C deficiency of the customary diabetic diets and stress the value of the medicinal administration of cevitic acid.

Problemy Tuberkuleza, Moscow

Pp 1 135 (No. 7) 1937 Partial Index

- Campaign Against Tuberculosis in Course of Third Five Year Plan S E Neznin I I Lyudvinovskiy and V S Koltzman —p 3
*Mechanism of Tuberculin Reactions L M Model —p 8
Alveolar Air in Pulmonary Tuberculosis E M Berkovich —p 25
Paratuberculous Lesions of the Heart T D Kan —p 36
Differential Diagnosis of Grip and of Infiltrating Tuberculous Pneumonia B P Levenshtein and S I Gutman —p 45
Demonstration of Bacillema in Tuberculous Patients L Sirotkina —p 67

Mechanism of Tuberculin Reactions—According to Model, the variations in the sensitivity of an organism to injections of tuberculin are not dependent on the antibody content of the blood. The determining factor is the state and the capacity for reaction of the systems to be stimulated, particularly the nervous-endocrine system. The toxic effect of tuberculin is not limited to a tuberculous organism, it is likewise evident when administered to a healthy organism in large doses. Habituation to the toxic effect of large doses of tuberculin does not indicate the cessation of its toxic effect on parenchymatous organs. Protracted tuberculin action on healthy animals has the effect of first stimulating the functions of the endocrine glands (the thyroid and the adrenals) and later causing degenerative processes. The effect of the tuberculin on the vegetative system is to provoke two types of reaction: that of stimulation and that of depression. Stimulation takes place when the tuberculin activates the function of the thyroid, the adrenals and the vegetative nervous system. Such a reaction has a therapeutic value because it improves the metabolism and cell nutrition and because it accelerates the absorption of inflammatory exudates. The reaction of depression, resulting from the inadequacy of the endocrine glands and of the vegetative nervous system, is expressed in manifestations of

intoxication and in the increase of the inflammatory state. As such it has no therapeutic value, on the contrary, it increases the focal inflammatory process, provoking grave subjective symptoms of intoxication. Its effect is to increase, under these conditions, the permeability of the endothelium, to provoke further exudation in the foci, to increase the anoxemia and to diminish the oxidizing processes in the tissues. The review of extensive material from the literature and the author's own observations on children with tuberculous toxemia suggest that tuberculin therapy under certain conditions is capable of exerting a beneficial effect. The observations of ophthalmologists on the favorable effect of careful tuberculin therapy in certain disorders of the conjunctiva and of the eyeball of a tuberculous nature are of particular interest in this connection. Such favorable reactions may be expected in the milder forms of the tuberculous disease. The author emphasizes that in the graver forms of tuberculosis the response to tuberculin takes on a toxic character and aggravates the focal process. He concludes that careful exhibition of tuberculin therapy is permissible in the milder forms of tuberculous processes in the presence of an adequate neuro-endocrine system.

Finska Lakaresällskapets Handlingar, Helsingfors

80 389 479 (May) 1937

- Serologic Diagnosis of Syphilis Test of Methods Used in Finland O Sievers —p 395
Nongonorrheal Urethritis with Joint and Eye Complications Case C Thesleff —p 411
*Tumors of Carotid Gland in Connection with Case in Which Operation was Performed in Finland C E Sonck —p 417
Abscess of Spleen Case, Contribution to Pathology and Therapy of Splenic Abscess H E Blomquist —p 454

Tumors of Carotid Gland—Sonck says that this is the first case of carotid tumor to be described from Finland. The tumor was located in the bifurcation of the carotid, had grown about the external carotid and surrounded the internal carotid in a deep groove. Although it could be loosened from the internal carotid, ligation of the external carotid was necessary. No nerves were injured. Recovery was rapid and uneventful and four years after the intervention the patient, a woman, aged 48, continues well. The tumor had been observed for seventeen years, measured 6 by 3.5 by 3 cm, and microscopically was a typical tumor of the carotid gland.

Norsk Magasin for Lægevidenskapen, Oslo

98 1243 1346 (Oct.) 1937

- Suffocation and Inflammation as Occurrences in General Clinical Pathology G von Bergmann —p 1243
Value of Haylick's Application of Ultraviolet Irradiation Preliminary Clinical Experiences from Division II Ullevål Hospital Oslo Widerøe —p 1262
*Hepatolenticular Degeneration (Hall) Case O Lingjærde —p 1267
Experimental Investigations on Extent of Anesthesia by Means of Ethyl Chloride L Efskind —p 1283
Asthenic Patients Problem of Asthenia I Aasland —p 1294
Psychosis After Insulin Intoxication B Helland Hansen —p 1306
Fibro Epithelial Tumor Papilloma Which Became Sarcoma O Berntzen —p 1314

Hepatolenticular Degeneration (Hall)—Lingjærde's patient, a man aged 22, without family history of hepatolenticular degeneration, had had the disorder for six years. No illness or trauma preceded. The picture was that of Westphal's pseudosclerosis, with heavy tremor of intentional kind, without rigidity, together with dysarthria and psychomotor symptoms. No pyramidal symptoms were present. There was increased albumin in the cerebrospinal fluid and the mastoc curve showed a marked depression. The patient died one month after admission to Rönvik Asylum. Besides a purulent bronchitis and bronchopneumonia, necropsy disclosed typical cirrhosis of the liver and macroscopic changes in the lenticular nuclei. Microscopic examination showed degeneration of the ganglion cells in the brain, especially in the lenticular nuclei on both sides, also in the optic thalamus, medulla oblongata and cerebral cortex, less marked degeneration of the reticular cells with appearance of Alzheimer's cells and Opalski cells and moderate proliferation of the glia in connection with the blood vessels. Pancreatitis, presumably of recent origin, with careous deposits in the kidneys, a slight fibrosis of the parathyroid glands and perhaps a slight degree of hyperplasia of the parathyroid glands were found. The author thinks that the pancreatitis and the hyperplasia of the parathyroid may have had a part in the rapid exacerbation during the last three months of life.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 110, No 4

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CHICAGO, ILLINOIS

JANUARY 22, 1938

PROLONGED RECUMBENCY AS A CONTRIBUTORY CAUSE OF DEATH IN ELDERLY PERSONS

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AND
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PHILADELPHIA

Every experienced physician has learned that when an elderly patient is confined to bed he is liable to become progressively weaker and die, despite the fact that his initial illness may not have been particularly serious. This complication is generally attributed to the development of hypostatic congestion, which predisposes the patient to bronchopneumonia. The precise nature of the disorder has received, however, relatively scant attention. In view of the clinical importance of the subject, the present study has been designed to clarify the mechanism by which prolonged recumbency exerts so harmful an effect on elderly persons and to indicate the fundamental principles of treatment.

METHODS

The study of effects which are due exclusively to confinement to bed required subjects who were thus confined although in relatively good general health. The observations to be reported were therefore made on a series of thirty patients in the orthopedic wards of the Philadelphia General Hospital who had fractured hips and four patients in the Philadelphia Orthopaedic Hospital and the Graduate Hospital of the University of Pennsylvania who underwent operations involving spinal arthrodesis.¹ The series included thirteen men and twenty-one women. In age, seven were under 60 and twenty-seven were between 60 and 83. Careful clinical examinations together with the following studies were carried out as a matter of routine and repeated at appropriate intervals: blood pressure, oscillometric index, venous pressure, time of circulation from arm to lung and from arm to head, electrocardiographic changes, vital capacity, complete blood count with Schilling index, urea nitrogen content of the blood and urinalysis. On a limited number of patients, determinations were also made of the basal metabolism and urea clearance. All patients (except four who were

first seen later in their course of treatment) were studied from the time of their admission to the hospital until they became ambulatory or died.

RESULTS

Of the entire series, seventeen patients died. In seven of the seventeen cases confinement to bed was not considered a significant contributory cause of death. Three of these seven patients died of apparently unrelated illness, such as intestinal obstruction. Four others were extremely ill on admission to the hospital, they had apparently failed to recover from their initial shock and remained in a semistuporous condition until death. The remaining ten patients, however, were admitted to the hospital in good condition, and their subsequent illness and death seemed to have been precipitated entirely by their confinement to bed. The ages of the last group ranged from 66 to 80. The average duration of life after admission was five weeks, with extremes of two and eight weeks. The clinical course was characterized by a progressive apathy which became a conspicuous feature during the second to fourth week in the hospital. In six of the ten cases death was accompanied by high temperature and evidence of bronchopneumonia, in the remaining four it was apparently due to cardiac failure associated with profound toxemia.

Within the age limits of the patients who died (from 65 to 83 years), there were also ten patients who survived. The condition of at least five of these patients became temporarily critical. The condition of the younger patients never became critical. It appears, therefore, that confinement to bed is rarely a serious complicating influence on the illness of patients who are in comparatively good condition and who have not yet reached the age of 60. In patients over 60 the ill effects of recumbency usually begin to manifest themselves during the second, third and fourth weeks in the hospital. If a patient survives this period in good condition, it is unlikely that further confinement to bed will be a significant cause of death, provided the initial malady is not progressive.

DETAILS OF OBSERVATIONS

The following observations, summarized in the table, were made in the course of the routine studies of the entire group.

The heart rate averaged between 70 and 100 and except for tachycardia during fever or paroxysmal auricular fibrillation showed no consistent tendency toward either acceleration or slowing.

The blood pressure tended to fall slightly during the first two weeks, but on the whole it was surprisingly well maintained, even when a patient had become practically moribund. In only five cases was a systolic pressure recorded at any time below 100 mm of mercury.

Read before the Section on Practice of Medicine at the Eighty Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1937.

From the Department of Medicine, School of Medicine and the Department of Orthopedic Surgery, Graduate School of Medicine, University of Pennsylvania.

¹ Drs. W. G. Elmer, Harry Hudson, J. R. Moore, J. T. Rugh and De Forrest P. Willard cooperated in permitting the use of their patients for study and the staff of the Laboratory of Clinical Pathology of the Philadelphia General Hospital carried out many routine tests.

The oscillometric index was not consistently affected, although its most common tendency was toward a progressive decrease (in about half of the cases). Since this measurement is an indication of several variable factors—blood pressure, cardiac output and vascular distensibility—no consistent result could be anticipated. With obvious reservations, however, a decrease in the oscillometric index may be considered suggestive of a corresponding decrease in the cardiac output per beat.

The venous pressure (fig 1), measured in the antecubital vein by the direct method, using a graduated L tube, averaged from 3 to 5 cm of blood above the calculated cardiac level (5 cm below the manubrium

mately the same (five cases) and only occasionally became definitely slower (three cases) except as minimal event (four cases).

The time of circulation from arm to lung was measured by the injection of 5 minims (0.3 cc) of into the antecubital vein. The values so obtained generally parallel to those of the pulmonary circulation, and there were no instances of an abnormal wide difference between the two times to indicate presence of isolated left-sided heart failure.

Serial electrocardiograms in about two thirds of cases showed changes in the ventricular complex which were related to the patient's continued confinement to bed.

Summary of Observations on Twelve Patients Over 65 Confined to Bed Because of a Fractured Hip*

Subject	Age	Sex	Days Under Observation	Arterial Pressure	Oscillometric Index	Venous Pressure Cm Hg	Pulmonary Circulation Time Seconds	Vital Capacity Ct Ce	Blood Urea Nitrogen	Day Out of Bed	Clinical Course (Figures in Parentheses Indicate Approximate Day of Onset of the Event)
C B	79	♀	31	130/75 130/60 90/50	5½ 5 3½	4½ 5 8	18 15 20	19 18 00	21 15	21	Conspicuous weakness (10) stupor (14) death (21)
H B	70	♂	43	128/84 140/70 110/60	4½ 5½ 4½	7½ 6½ 1	13 20 23	12 13 07	17	0	Irrational (?) semistupor (14) death (43)
M D	72	♂	32	100/55 115/60 130/70	8 10 8	6 3 5½	30 27 17	09 15 19	17 18 24	0	Apathy (16) extensive ulceration paroxysmal auricular fibrillation (16) death (32)
E F	66	♀	14	210/120	2½	6½	20	00	23	0	Apathy (10) coma (19) death (21)
H J	70	♂	61	140/100 118/64 120/78 110/70	½ 5 3½ 3½	2 6½ 2½ 3½	16 17 16 10	07 15 10 18	11 16 12	0	Ulceration of back (?) spread to entire body fever progressive (31) death (61)
A K	82	♂	58	150/80 180/60 140/60	4½ 7½ 2	1 1½ 2½	20 17 23	27 20 00	10 17 18	14	Out of bed (14) but returned less of ulcer (24) became apathetic (24) stuporous (48) death (51)
J M	78	♀	51	134/60 130/50 130/50	5 6 3½	3 2 3	13 20 15	11 01 03	20 16 16	21	Apathy (10) slightly improved (21) up in chair (21) remained weak (21) somnolent sudden death (41)
M R	80	♀	45	130/70 120/60 120/60	4 3½ 3	1½ 1½ 1½	10 17 20	13 10 00	34 34 23	6	Progressive weakness and delirium sudden stupor fever (21) death (40)
R S	80	♀	27	130/60 140/60 120/50	3½ 3 2	3½ 3 1	17 16 22	00 00 24	13 16	21	Sudden stupor three days after getting up in a chair (24) increasing fever death (24)
G D	82	♂	74	140/75 120/60 120/60	4 4½ 4	½ 3½ 4	22 23 23	24 27 33	9 22 19	32	Weak and dehydrated (10) fever and dermatitis after getting up in a chair (50) ultimate recovery
A H	76	♀	122	115/70 110/60 120/70	2 1½ 2	4 2 1	20 18 18	12 08 23	22 19 23	101	Extreme weakness and apathy (1) arterio-sclerotic ulcers of legs (1) improving (90) recovery
T W	65	♀	131	120/60 112/60 90/40	4½ 2½ 4	7 3 5	25 17 13	17 20 15	13 18 9	121	Course uncomplicated except by weakness and gastro-intestinal disturbances recovery

* Of these patients the first nine died the last three recovered. The first figures in each column were obtained shortly after admission to the hospital and the last figures were obtained shortly before death. The second figures were selected from those obtained about the middle of the period of treatment and the last figures were obtained shortly before death.

sterm) Of the ten patients who died, nine showed either an initial fall of venous pressure or a consistently low level which did not exceed 3 cm. Only one patient had a venous pressure consistently over 8 cm, which indicated a slight degree of peripheral congestive heart failure.

The time of circulation from arm to head (fig 2) was measured by the injection of 4 cc of a 10 per cent solution of strontium bromide into the antecubital vein according to the technic of Bellet.² Of eighteen patients over 60 years of age whose circulation time was measured on admission, the majority (sixteen) were found to have a rate of pulmonary blood flow which was slower than the normal limit of 16 seconds. After confinement to bed for a week or more, the rate usually became faster (ten cases), less often remained approxi-

ment to bed (fig 2). These changes most commonly consisted of increase in the amplitude of the T wave especially in leads 1 and 2, during the first month after confinement. The T waves during the second month and occasionally, deviation of the ST intervals prior to death. The two last types of change and occasionally also the first type are indicative of myocardial infarction. The electrocardiogram usually reverted to its original configuration after the patient had been out of bed for a week or more, and persistence of a pathological change occurred in only one instance. This observation is important from the medicolegal aspect since it indicates that any ill effects on the heart which may have been produced by confinement to bed in the treatment of fractures are not necessarily permanent.

Measurements of the vital capacity were generally in the range of from 1 to 3 liters. In only three patients who died was there any progressive decrease in

² Bellet Samuel. The Measurement of the Circulation Time by the Use of Strontium Bromide. To be published.

capacity prior to the time when the patient became too weak to perform the test. As a rule the vital capacity either remained unchanged or tended to become slightly increased. The results of this test were added evidence that pulmonary congestion of the type which occurs in heart failure was not common.

Basal metabolic rates were estimated for six patients. For five of these the rates were between -11 and -26 per cent, and one rate, which was not truly basal because of the patient's cold, was -6 per cent. These results are in accord with the accepted view that the metabolic rate decreases during confinement to bed.

The urea nitrogen content of the blood was not consistently affected. In some instances it tended to rise progressively until the patient was allowed out of bed, in others it exhibited a progressive fall. None of the patients who were admitted to the hospital in good condition exhibited a rise sufficiently marked to indicate a significant degree of uremia.

Blood counts in many instances showed the presence of mild anemia, but there was no noteworthy progressive change in the number of red cells or leukocytes. The differential count, however, almost always showed an increase in the percentage of neutrophils in the patients who later died, while in all the elderly patients there was a shift to the left in the Schilling count which confirmed other clinical signs of toxemia.

Many of the secondary complications which appeared also pointed to the nature of the physiologic disorder produced by confinement to bed. Decubitus ulcers occurred in all except six of the patients over 60 years of age who survived and in all except two who died. They often appeared with extraordinary rapidity, especially if the patient was emaciated, lethargic or uncon-

scious. Mental disturbances also occurred in various forms. These included extreme apathy, which was present in all patients over 70 years of age, toxic psychoses in which the patient became irrational, disoriented and incontinent, periods of euphoria or irritability and finally stupor, which was inevitably followed by death.

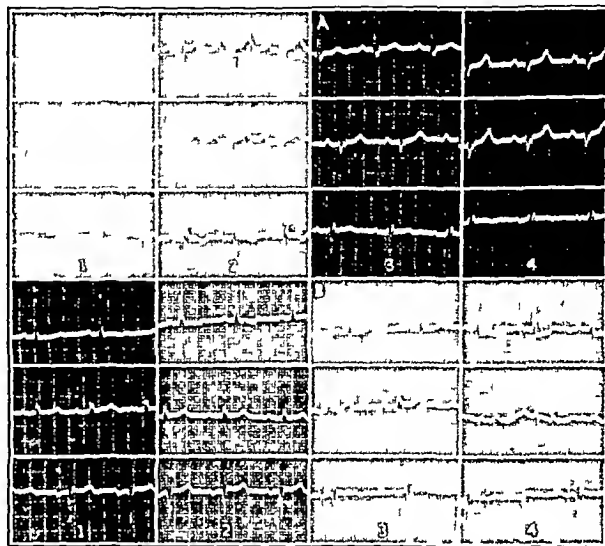


Fig 2—Electrocardiograms showing changes associated with prolonged confinement to bed. A tracing of A H a woman aged 76 1 on admission 2 during fifth week 3 during fifteenth week and 4 during twentieth week (patient out of bed). B tracing of J M a woman aged 78 1 on admission 2 during first week 3 during third week 4 during fifth week (patient still in bed and died two weeks later).

The predominant mental disorder was of the type produced by profound toxemia rather than by purely senile change.

Dehydration, as manifested by extreme dryness of the tongue, was conspicuous in all the patients who died and in the majority of elderly patients who survived. In many instances it followed the failure of the patient to maintain an adequate fluid intake because of apathy, weakness or dislike of using a bed pan. In the cases, however, in which a good fluid intake was maintained, another cause was probably acting, namely, the gravitation of a large part of the blood volume into the dependent portions of the body, leaving the upper portions relatively dehydrated, as in shock.

The development of marked cyanosis of the extremities and back was often a conspicuous sign of the critical condition of the patient. This cyanosis was not due to a low oxygen content of the arterial blood, for the blue color of the forearm turned to a bright red when reactive hyperemia was produced. It could have been caused only by anoxemia of venous blood, an increasing volume of which circulated very slowly, if at all, through the dependent tissues.

COMMENT

The data which have been obtained in this study indicate that confinement to bed induces the following effects in elderly persons:

Blood accumulates in the venous capillaries. The volume of blood which circulates through the larger vascular channels is thereby reduced, it returns to the heart at a low venous pressure, passes through the lungs at a rate which may tend to increase and receives in the lungs an adequate oxygen content. Because of the decreased venous return, the cardiac output is also decreased, and the arterial pressure therefore tends to

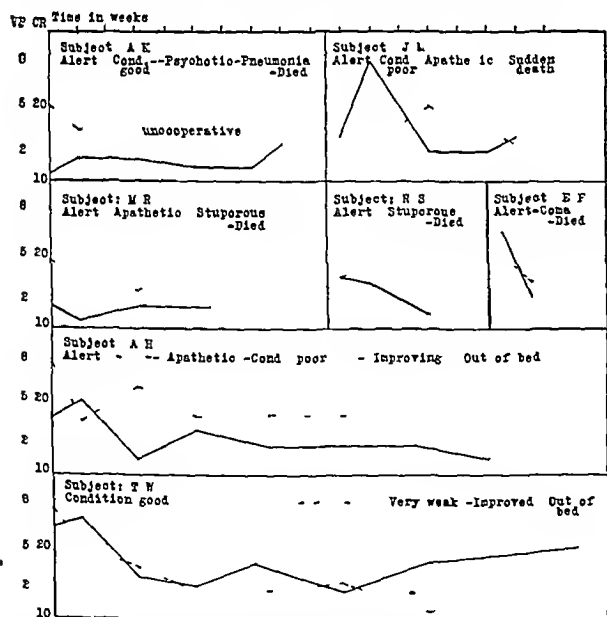


Fig 1—Comparison of venous pressures (unbroken line) and rates of circulation from arm to head (broken line) in five subjects who died and two who survived. The venous pressure is usually low; the circulation rate is usually slow and tends to accelerate but may become slow again as a terminal event.

tinued. In one patient ulcers of the skin developed over the entire body, in two others gangrenous lesions of the arteriosclerotic type developed in the legs. The common cause of all these lesions was undoubtedly malnutrition of the tissues due to insufficient local blood flow.

fall but is maintained within normal limits by compensatory vasoconstriction. The vasoconstriction, however, creates a vicious cycle by obstructing blood flow through the periphery of the body and thus shunting more blood out of circulation. The ensuing state of relative circulatory insufficiency is closely analogous to shock prior to the stage of vasomotor collapse. In consequence of it, there occurs a depression of the metabolic rate and of cardiorenal function, but there is usually no congestion of the type associated with primary heart failure.

Elderly persons are obviously predisposed to such a train of events, since confinement to bed has so much less effect on younger persons. The only likely cause of this predisposition is the senile sclerotic changes in the small peripheral vessels. Such changes impair vasomotor function and hinder the circulatory readjustments which are made in response to changing needs of the body. Blood tends, therefore, to remain in the capillaries until forced into the veins by the contractions of the skeletal muscles. It is undoubtedly the decrease in the number of voluntary muscular movements occurring when a patient becomes confined to bed and probably also the consequent decrease in muscle tonus³ which aggravates the initial circulatory fault to the point of producing serious complications.

The condition as it has been described is not inevitably fatal. Death, when it occurs, results from the development of secondary factors which appear in cases of prolonged shock, namely, toxemia and capillary damage. The insufficiency of the peripheral circulation causes degeneration of the tissues, manifested by decubitus and arteriosclerotic ulcers. The continued absorption of the products of tissue degeneration and the increasing damage to the capillaries caused by local anoxemia ultimately assume the dominant role in perpetuating the circulatory disorder. Once these factors have supplanted the influence of muscular inactivity, it becomes impossible to save the patient's life by ordering him out of bed. The purely mechanical effect of muscular contractions is no longer capable of restoring the circulation to its normal state. In spite of all treatment the patient sinks slowly into stupor. If pneumonia terminates his life, it represents little more than the final invasion of bacteria after the resistance of the pulmonary tissues has been destroyed.

The essential part of the treatment of this condition is to order the elderly patient out of bed before toxemia and permanent capillary damage have become firmly established. The time when this change occurs depends largely on the patient's previous health and on the severity of the malady for which he is being treated. In the subjects of this study who had fractured hips, the critical period included the second, third and fourth weeks in the hospital. Certain patients who have been chronic invalids and accustomed to remaining in bed or who are possessed of the vascular efficiency of a younger person may be confined without obvious ill effect. The risk, however, is always serious with persons over 65. Such a risk is especially to be considered in cases of senile heart disease, it is quite possible that many patients with this condition who are put to bed die as a result of the contributory effect of this form of circulatory insufficiency rather than of their initial cardiac lesion.

Whenever it is necessary to confine an elderly patient to bed, alternative methods of maintaining muscular

activity should be carried out. Such activity includes regular voluntary exercises, systematic deep breathing, massage and periodic shifting of position. The patient should be kept mentally alert and cheerful, preferably by some form of occupational therapy. Attention should be paid to the fluid intake, bowels and care of the skin. Drug therapy is of secondary value, but coffee, small amounts of whiskey, strychnine and benzedrine may serve a useful function as stimulants. For appropriate patients who have resisted other forms of treatment, Freeman⁴ has suggested the benefit of transfusion on the basis of its effectiveness in comparable cases of shock.

SUMMARY AND CONCLUSIONS

Confinement to bed appears to have been responsible for the death of ten patients, all of them over 65 years of age, of a series of thirty-four patients confined to bed for orthopedic treatment.

The observations made in this study indicate that the malady induced by confinement to bed is closely analogous to shock. Lessening of the number of voluntary movements made by an elderly person whose circulatory adaptation is impaired results in a progressive accumulation of blood in the venous capillaries and a progressive decrease in the volume of blood which circulates through the large vessels. Congestion comparable to that which occurs in heart failure is not characteristic. Local anoxemia and consequent degeneration of the tissues lead to toxemia and to permanent capillary damage, which perpetuate the circulatory fault and ultimately result in death.

Successful treatment depends on increasing the patient's activity prior to the time when toxemia and capillary damage have supplanted the insufficiency of muscular contractions as the dominant factor in the reduction of the peripheral blood flow.

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ABSTRACT OF DISCUSSION

DR. ROBERT WILSON, Charleston, S. C. The frequently quoted expression of Dr. Osler that age is largely a matter of the tubing is recalled by this study of Drs. Laplace and Nicholson. They conclude that the inability of old people to maintain the recumbent posture very long without more or less serious consequences is most likely due to senile sclerotic changes which occur in the small peripheral vessels. With advancing years there is a reduction in the elastic element and a development of fibrosis which lessens the responsiveness of the vessels and produces a tendency on the part of the larger vessels to dilate. This condition leads to a slowing of the circulation, as demonstrated in this study. The vascular changes produce a reduction in the nutrition of the tissues which is conspicuous in advanced life. That such changes do not occur uniformly in old persons may explain the difference so often noticed among people of the same age, and to this is probably due the fact that old persons do not suffer equally from the effects of recumbency. The relatively slight effect of prolonged recumbency on blood pressure is significant. One patient, for example, who died, had an initial blood pressure of 130 systolic, 75 diastolic, and a final blood pressure of 90 systolic, 50 diastolic, while one who recovered had an initial blood pressure of 125 systolic, 60 diastolic, and a later reading of 95 systolic, 40 diastolic. Obviously no prognostic conclusion can be drawn from the blood pressure. The importance of toxemia in obscuring and in complicating the situation is well emphasized, and it furnishes an important prognostic and therapeutic indication. Another important factor which merits attention is the adequacy or inadequacy of the vitamin content of the patient's diet.

³ Hender on, Landell, Oughterson, A. W., Greenberg, L. A. and Searle, C. P. Muscle Tonus, Intramuscular Pressure and the Venoprecipitate Mechanism. *Am. J. Physiol.* 114: 261 (Jan.) 1936.

⁴ Freeman, D. E. Personal communication to the author.

comparison of these cases with those of shock would suggest the therapeutic value of intravenous dextrose as well as of transfusions to secure a more adequate blood volume. Attention has been called to the value of strychnine in large doses in the treatment of shock and is mentioned as valuable in this study. Henderson and his co-workers found that strychnine increased muscular tonus very markedly, but there was a striking difference in its effects in normal and in toxic subjects. It is very probable that this would be true also in the nutritive degenerative changes that occur in the muscles of elderly people, it is still more likely to be ineffective in the presence of toxemia.

DR CLARENCE L. ANDREWS, Atlantic City, N. J. The authors have made a real contribution to the study of the causes of death in elderly people confined to bed. Several pertinent facts stand out. 1. Of their thirty-four patients, seven were under 60 and twenty-seven older than 60. 2. Seventeen died. 3. All who died were older than 60. 4. Of the seventeen who died, three died from intestinal obstruction and four from severe toxemia. 5. Six of these ten had high temperatures, pulmonary congestion and signs of bronchopneumonia, four died of cardiac asystoles associated with extreme toxemia. 6. The ten patients who died and the ten patients older than 60 who recovered manifested stormy symptoms from the second to the fourth week, if they survived this period, they usually got well. 7. None of those younger than 60 manifested these stormy symptoms. 8. Ten who died showed (a) apathy, (b) peripheral stasis, (c) tendency to pulmonary congestion and (d) signs of bronchopneumonia. Arm to head and arm to lungs circulatory tests, electrocardiograms, oscillometric index and vital capacity failed to incriminate left-sided heart failure as the cause of death but it did not disprove that they did not die of right-sided congestive heart failure. There was peripheral stasis, decrease in return blood flow to the right side of the heart, pulmonary congestion and bronchopneumonia. This is in keeping with the work of Dr. Louis Gross of Montreal that there is a progressive letdown in circulatory efficiency of the right side of the heart after 60.

DR DE FOREST P. WILLARD, Philadelphia. The conclusions that may be drawn from this study are of intense interest to all surgeons, and perhaps most especially to the orthopedic surgeon. Surgical intervention in persons above 60 years of age falls, in the majority of cases, into the nonemergency group of operative work, that is to say, the surgeon may choose the time when any given operation will be best tolerated by the patient. In the past, the surgical profession has laid much more stress on the type rather than on the tempo of operative procedures. Surgical procedures have been standardized and surgical technique has been perfected with the hope of minimizing the unavoidable ill effects that are inherent in any surgical procedure. Methods of anesthesia are steadily improving with the same end in view. However, little has been done along the lines of research conducted in this paper, that is, in finding scientifically whether it is safe to operate as well as when the patient is best able to withstand any type of surgery. A surgeon may have unusual ability to select and to perform the best surgical procedure for any given case, but his best efforts will result in failure if they are done at a time when the patient is least able to withstand operative shock. The importance of this question of operative timing cannot be too strongly stressed. This paper has made a distinct beginning in giving the surgeon specific data by which he may determine the optimal time for surgery on elderly people. As our knowledge of this proper timing advances and as new facts come to light, not only the patients who have passed the three score mark but also those in the earlier decades of life will be benefited. It is well known that any active person who is suddenly forced into the complete inactivity of recumbency must go through a more or less difficult period of adjustment to his new method of life. And it seems to me that surgeons will be able to apply to all non-emergency operations many of the principles that they are beginning to learn in the proper handling of surgery in the elderly.

DR NORMAN E. FREEMAN, Philadelphia. The authors have mentioned the development of a "toxemia" as a step in the downward course of their patients. It hardly appears necessary to advance such a hypothesis. It is recognized that inadequate

circulation to the body tissues, whether brought about through insufficient return of blood to the right side of the heart and the consequent reduction in cardiac output, or brought about through reflex vasoconstriction, causes an asphyxia of the tissues. Such an asphyxia damages the endothelial wall of the blood vessels so that no longer are the vessels able to retain the plasma. With loss of plasma, concentration of the blood will occur and a further slowing of the blood stream. The condition of shock is eventually produced.

DR J. E. HIRSH, Birmingham, Ala. I have been particularly interested in this excellent presentation. All physicians have had the experience of having senile cardiac cases. We have recognized that they have been very sick, and there has been marked decompensation. We have realized that the end is not far off. But often we have walked into the ward, and the intern or the nurse has told us that the patient has quietly passed out during the night. Because of this fact, a few years ago I analyzed a series of cases in which death ensued somewhat unexpectedly in these senile individuals with myocardial damage. All the patients in question were over the age of 60. Thirty-eight cases were followed to the postmortem table. On postmortem examination it was found that, of this total of thirty-eight, twenty-three had definite antemortem thrombi in the femoral vessels, extending in some cases up to the iliac vessels. Of these twenty-three, fourteen had definite emboli in the pulmonary vessels. I feel that those pulmonary emboli caused the sudden death in these patients. Because of presence of the emboli in these cases we have since shortened the time in bed of this type of patient. Just as soon as I feel that they can possibly sit up, we put them in a sitting posture, and I believe that our mortality rate has been lessened as a result of this. Of course, the eventual demise takes place in all cases, but the death is not wholly unexpected.

DR L. B. LAPLACE, Philadelphia. Dr. Nicholson and I appreciate the interesting discussion of our paper. Dr. Wilson's view regarding strychnine is shared by most of the leading contemporary physicians. We have mentioned strychnine, however, because the recent work of Randall Henderson and his associates has apparently demonstrated that it produces an increase in muscle tonus, an effect which, theoretically at least, should favor the return of venous blood to the heart. The dietary factor has been mentioned and is of considerable importance. Many of our patients ate so little that the manifest influence of starvation undoubtedly contributed to their debility. Dr. Andrews mentioned right-sided heart failure as a likely cause of circulatory insufficiency. Such a condition probably occurred in one patient of our series who exhibited a relatively high venous pressure, but it did not suggest itself to us as an explanation for the condition of the other patients, in all of whom the venous pressure was within normal limits or abnormally low. Dr. Willard has pointed out an important surgical problem. What is the optimum time at which to reduce a fractured hip in an elderly person? In the majority of instances it appears safest to apply a cast and order the patient out of bed as promptly as possible. Even when signs of shock are still present, it sometimes proves fatal to await the customary period for recovery, as many of these patients pursue a progressively downhill course and the only chance of saving their lives by getting them out of bed is soon lost.

The Greatest Human Achievement—Man has had to fight his battle against the micro-organisms—plant and animal—without any aid except the resistance of his own body cells and their products, up to the late dawn of bacteriological and immunological science. In spite of the remarkable progress made against these previously invisible enemies, they constitute, seemingly, the greatest menace to the survival of our species. The more we know about the pathogenic bacteria, spirochetes, fungi, filterable viruses, and protozoa, the more we marvel at the success of man in combating these rapidly evolving, highly adaptive, and predatory organisms by his own internal resources. The unspectacular headway against these insidious enemies made by medical science constitutes probably the greatest human achievement.—Hooton E. A. Apes, Men and Morons, New York, G. P. Putnam's Sons, 1937, page 288.

THE TOXICITY OF SULFANILAMIDE

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Despite the widespread use of sulfanilamide (para-aminobenzenesulfonamide) in the treatment of certain bacterial infections, very scanty data are available concerning its toxicity for animals. Several observers have reported on its toxicity, using very limited numbers of animals. Buttle and his co-workers,¹ giving the drug in acacia suspension by mouth, state that 2.5 Gm per kilogram is innocuous, 4 Gm is tolerated but produces incoordination and paralysis, 5 Gm kills two of six mice, and 10 Gm kills six of six mice. Rosenthal² reports that, administered subcutaneously in olive oil suspension, 4 Gm per kilogram killed none of five mice, while 6 Gm per kilogram killed three of four mice. Chen³ found the $L D_{50}$ ⁴ for mice by intravenous injection to be from 0.35 to 0.40 Gm per kilogram. Raiziss and his co-workers⁵ report that 2.5 Gm per kilogram by subcutaneous injection kills six of six mice. These observers also give for rabbits on oral administration the $L D_{50}$ as 2 and $L D_{100}$ as 2.5 Gm per kilogram. Recently Halpern and Mayer⁶ have published data on the comparative toxicity of 4'-sulfonamido-2,4-diaminoazobenzene (prontosil), benzyl-sulfanilamide and sulfanilamide for several species of animals. For sulfanilamide, they report for oral administration the $L D_{50}$ as 6 Gm per kilogram for mice, and the $L D_{90}$ as 4 Gm per kilogram for rats. They state that the toxic dose for the rabbit is 2 Gm per kilogram and, for the dog, 1 Gm per kilogram. Dogs given this toxic dose show ataxia, athetotic movements followed by rigidity, tonic-clonic convulsions and finally coma. As far as we are aware, no data at all have been published on the toxicity of acetyl-sulfanilamide (para-acetylaminobenzenesulfonamide), although sulfanilamide is partly changed to this derivative when administered to the human subject.⁷

We present here observations on the acute toxicity of sulfanilamide and acetyl-sulfanilamide for mice, rabbits and dogs, as well as limited data on chronic toxicity for dogs and rats. Certain observations on the effect of sulfanilamide on the blood picture, acid-base equilibrium and renal function are included. All administration of sulfanilamide or acetyl-sulfanilamide has been by the oral route.

This investigation has been aided by a grant from the Josiah Macy Jr Foundation.

Drs. Cutting and Emerson are Fellows in Experimental Therapeutics and Medicine.

The Winthrop Chemical Company furnished the sulfanilamide and acetyl-sulfanilamide.

From the Department of Pharmacology and Experimental Therapeutics the Johns Hopkins University School of Medicine.

Dr. Edward M. Walz carried out the experiments on acidosis and Dr. A. R. Rich examined the microscopic sections reported on in this paper.

¹ Buttle G A H, Gray W H and Stephenson Dora. *Lancet* 1: 1286 (June 6) 1936.

² Rosenthal S M. *Pub Health Rep* 52: 48 (Jan 8) 1937.

³ Chen K K. Personal communication to the authors.

⁴ We have used Trevan's (Proc Roy Soc B 101: 483 1927) nomenclature for the doses killing various percentages of the animals. $L D_{50}$ and $L D_{100}$ mean the doses killing 50 and 100 per cent of the animals respectively. The median lethal dose is the $L D_{50}$.

⁵ Raiziss G W, Severac Marie and Moetich J C. *J Chemotherapy* 14: 1 (April) 1937.

⁶ Halpern B N and Mayer R L. *Presse med* May 19 1937 p 747.

⁷ Marshall, E K Jr, Cutting W C and Emerson Kendall Jr. *Science* 85: 202 (Feb 19) 1937.

ACUTE TOXICITY

The toxicity of both sulfanilamide and its acetyl derivative was determined for mice. The drugs were administered in 10 per cent suspension in acacia by mouth. The animals were observed for four days. Table 1 summarizes the results. With acetyl-sulfanilamide, death usually occurred somewhat later than with sulfanilamide. The symptoms observed in the mice were similar with the two compounds and of the same general nature as those observed in dogs and rabbits. By oral administration of sulfanilamide, the foregoing data indicate that the $L D_{50}$ for mice is 3.8 Gm per kilogram, that the $L D_{100}$ is over 10 Gm per kilogram and that 0.9 Gm per kilogram will kill one mouse in 10,000.⁸ The toxicity of the acetyl-sulfanilamide appears to be somewhat greater than that of sulfanilamide. We do not believe that the use of acacia influences appreciably the toxicity of these substances.

Seven dogs were given 1 Gm per kilogram of sulfanilamide in gelatin capsules by mouth and observed for symptoms. One animal showed no symptoms and another only slight ataxia. The other five exhibited moderate or severe symptoms of poisoning—salivation, vomiting, diarrhea, hyperpnea, excitement, muscular weakness, ataxia, signs of stimulation and depression of the central nervous system leading to a condition of spastic rigidity of the limbs and hypesthesia. The early stages of the poisoning resemble those seen in dogs given large doses of ethyl alcohol, the later stages in many respects are similar to those shown by a decorticated dog. The placing reactions, known to be due to the cerebral cortex,⁹ were absent in dogs after the large doses of sulfanilamide, and the dogs appeared to be blind. All symptoms disappeared in from ten to twelve hours, and the animals appeared normal. Nine dogs received from 1.6 to 2 Gm per kilogram and all showed symptoms of poisoning. In one animal the symptoms were very slight (as a result of vomiting a large portion of the dose), in another, very severe prolonged symptoms and death occurred, while in the remaining animals the symptoms were not more severe than those seen in dogs with half the dose. All but the one animal ultimately recovered. Two dogs received a total of 5 Gm per kilogram in four days and a third animal 6 Gm per kilogram in five days and all appeared to recover completely. A dose of 0.5 Gm per kilogram given to two dogs caused symptoms in one and no symptoms in the other. Doses of 0.1 and 0.2 Gm per kilogram have been given on numerous occasions to many dogs without any observable symptoms.

A dose of 1 Gm per kilogram was given to seven rabbits, two of which showed no symptoms. The symptoms in the other five were similar to those shown by the dogs. Two rabbits receiving 3.5 Gm per kilogram in the course of two days died.

Administration of from 0.1 to 0.2 Gm per kilogram of acetyl-sulfanilamide to dogs did not cause any symptoms. Seven dogs received 2 Gm per kilogram of acetyl-sulfanilamide. One showed severe symptoms similar to those from sulfanilamide and died on the fourth day and one vomited, while the other five did not exhibit any symptoms. Two rabbits received 2 Gm per kilogram of the acetyl derivative without showing any symptoms.

⁸ These data are obtained by plotting dose against percentage deaths on logarithmic probability paper according to Gaddum and Council Special Reports No 183 (1933). The standard deviation of the logarithm of the dose is 0.18 or 31 per cent of the logarithm of the lethal dose.

⁹ Bard Philip. Studies on the Cerebral Cortex. *Arch Neurol Psychiat* 30: 40 (July) 1933.

In the administration of very large doses of a drug by mouth as in these experiments it is obvious that absorption from the intestinal tract may be a very important factor in toxicity. With large doses of both sulfanilamide and acetyl-sulfanilamide the variation in absorption may explain the variability in the reaction of animals to large doses. Our previous studies¹⁰ on absorption of sulfanilamide in the dog have shown that a dose of 0.1 Gm per kilogram is completely absorbed from the intestine in four hours or less. Later data¹¹ indicate that this is true also of double the dose

TABLE 1—Toxicity of Sulfanilamide and Acetyl-Sulfanilamide for Mice

Dose Gm per Kg	Sulfanilamide		Acetyl Sulfanilamide	
	Number of Mice	Per Cent Died	Number of Mice	Per Cent Died
1	12	83	12	00
2	23	71	20	45
3	24	250	23	570
4	20	600	20	700
5			12	750
6	24	880	24	990

(0.2 Gm per kilogram). We have made numerous determinations of the concentration of sulfanilamide in blood after large doses by mouth and conclude that with doses up to 0.5 Gm per kilogram the blood concentration in any individual animal is generally directly proportional to the dose. Between 0.5 and 1 Gm per kilogram the absorption is somewhat slower, while in many cases no greater blood concentration is attained with a dose of 2 Gm than with 1 Gm per kilogram.

Acetyl-sulfanilamide is much less soluble in water than sulfanilamide and might be expected to be absorbed less readily and completely than sulfanilamide. The lack of symptoms in dogs from a dose of 2 Gm per kilogram is due to lack of absorption of the drug from the intestinal tract. Thus, in five dogs given this dose the maximum blood concentrations reached were between 7.5 and 14.3 mg per hundred cubic centimeters of acetyl-sulfanilamide (calculated as sulfanilamide), not more than might be attained from doses one twentieth as large. The difference in absorption of sulfanilamide and acetyl-sulfanilamide in small and large dosage in one dog is shown in chart 1. However, it is obvious that intestinal and renal activity is markedly decreased the acetyl derivative may continue to be absorbed and a high blood concentration be reached. This happened in the case of one dog given 2 Gm per kilogram, death resulting after four days with a blood level of 23 mg per hundred cubic centimeters of free and 91 mg per hundred cubic centimeters of total sulfanilamide.¹²

The absorption of the acetyl-sulfanilamide in mice is similarly slower and less complete than of sulfanilamide. The figures in table 2 are averages of the blood concentrations of one or two groups of three mice killed at various intervals after the administration of 3 Gm per kilogram of sulfanilamide and acetyl-sulfanilamide.

One should expect a much better correlation of toxic action with blood concentration than with actual dose by mouth. Although sufficient data are not available to

make it possible to decide whether or not different animals react differently to the same blood concentrations of sulfanilamide, certain facts in relation to blood concentration and symptoms in dogs are of interest. No observable symptoms have been seen with blood concentrations under 30 mg per hundred cubic centimeters,¹³ mild symptoms of excitement, weakness and slight ataxia may result from a blood level of 40 mg per hundred cubic centimeters, rather severe symptoms may be present with a blood level of 60 to 80 mg per hundred cubic centimeters, and very prolonged coma with marked rigidity and later complete paralysis appears to result from blood concentrations over 100 mg per hundred cubic centimeters. The highest blood concentrations of sulfanilamide we have observed in dogs have been 133 and 181 mg per hundred cubic centimeters.

CHRONIC TOXICITY

Two dogs were given daily doses of 0.2 Gm per kilogram (on basis of initial weight) of sulfanilamide for several months. Two doses (0.1 Gm per kilogram each) were given each day at 9 a m and 5 p m in gelatin capsules by mouth. The concentration of sulfanilamide in the blood was determined once a week just before the morning dose and three hours after the evening dose to obtain the limits of blood concentrations to which the animals were subjected. The first animal (P4) received the drug for 128 days. The initial weight was 11.5 Kg and the weight at the end 14.8 Kg. The blood concentration in the morning samples varied from 5 to 13.6 mg per hundred cubic centimeters and in the evening samples from 8.5 to 20 mg per hundred cubic centimeters. In the last week of the experiments, samples of urine were examined and red and white blood counts and differential counts made. No abnormalities were noted. The animal was killed and examined. Sections of liver, kidney, spleen, heart, lung, adrenal, pancreas and bone marrow were found to be normal.

The second dog (P5) received the drug for seventy-two days. The initial weight was 11.9 Kg and its

TABLE 2—Absorption of Sulfanilamide and Acetyl-Sulfanilamide in Mice

Time After Drug	Mg per 100 Cc. in Blood After			
	Sulfanilamide		Acetyl Sulfanilamide	
	Free	Total	Free	Total
4	110	113	3	30
8	126	134	2	26
24	38	67	5	27
30			0.3	3
48			0	0.6

weight at the end of the experiment was 7.6 Kg. On the seventeenth day of the experiment the dog gave birth to three puppies. The blood concentration in the morning samples varied from 3 to 12.5 mg per hundred cubic centimeters of sulfanilamide and in the evening samples from 10 to 28.5 mg per hundred cubic centimeters. In the last two weeks of the experiment the dog appeared sick and lost considerable weight. Death occurred on the seventy-second day. At autopsy a massive infection with *Dipylidium caninum* was found in the intestine and one heart filaria (*Dirofilaria immitis*) was found in the heart. Sections

10 Marshall E. K. Jr., Emerson, Kendall Jr. and Cutting W. C. *Para-Aminobenzenesulfonamide* J. A. M. A. 108:953 (March 20) 1937.

11 Marshall E. K. Jr., Emerson, Kendall and Cutting W. C. *J. Pharmacol. & Exper. Therap.* 61:196 (Oct.) 1937.

12 It is interesting to note that when acetyl-sulfanilamide is given to the dog, rabbit or mouse a portion is changed to sulfanilamide. When sulfanilamide is given it is partly acetylated in the rabbit and mouse but not in the dog.

13 These data are for single doses when blood concentration may remain at this level for only a short time. Prolonged continuance at such blood concentrations may or may not cause increased toxic symptoms.

of liver, kidney, spleen, heart muscle, lung, adrenal and bone marrow were examined and found to be normal. Our impression is that death was not due to sulfanilamide alone but either to the infections or to infection plus sulfanilamide.

Since the growth curve of young rats is very easily affected by the administration of toxic substances and

of the experiment both groups were killed and samples of various tissues (liver, kidney, spleen, heart, adrenal, thyroid, intestine and bone marrow) taken from each animal for microscopic examination. In the control group many of the liver and kidney sections showed areas of hemorrhagic necrosis, while the organs of the animals treated with sulfanilamide were essentially normal.

The experiments were repeated on a second lot of rats with the exception that 0.75 in place of 0.25 per cent of sulfanilamide was added to the food of the treated group. Calculation from food intake shows that each of the treated rats received on an average from 0.46 to 1.02 Gm per kilogram of sulfanilamide daily. Chart 3 gives the average growth curves of the series. Microscopic examination at the end of the experiment showed various organs of each rat (liver, kidney, spleen, heart, testis, ovary, adrenal, thyroid and bone marrow) of both the control and the treated group to be normal.

In both control and treated groups of the two series the females became pregnant and gave birth to young.

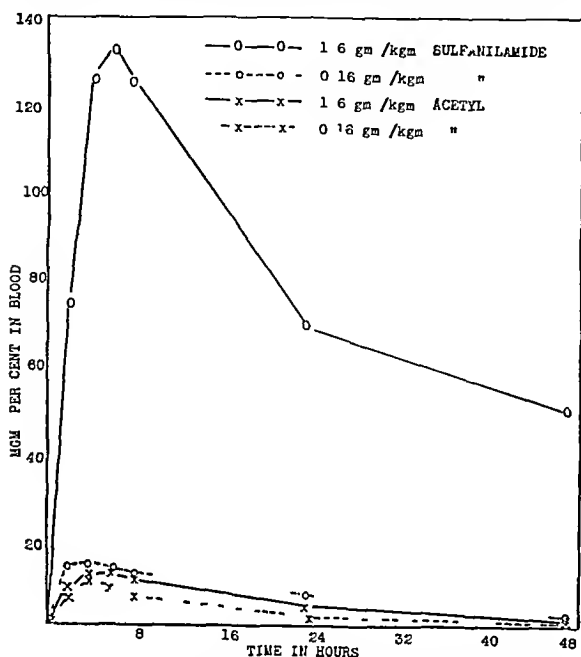


Chart 1—Difference in absorption of sulfanilamide and acetyl sulfanilamide in small and large dosage in a dog given at different times a small and a large dose of these drugs. Dosage and concentrations of acetyl sulfanilamide are expressed in terms of sulfanilamide.

since, like the human subject, the rat changes sulfanilamide partly to the acetyl derivative, we have studied the effect of sulfanilamide on growing rats. Two litters of young rats were divided into two groups of six each, littermates being used in each group. The control group was fed on a modified Steenbock diet,

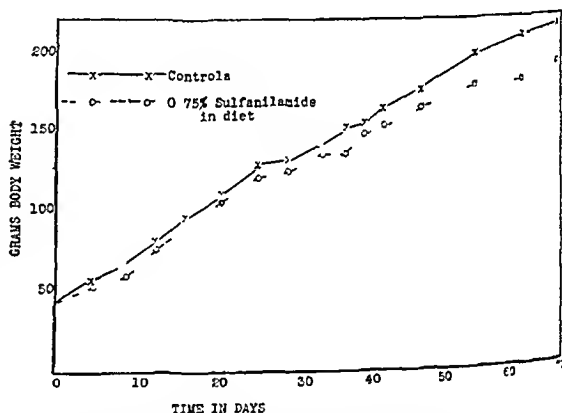


Chart 3—Average growth curves of young rats treated with 0.75 per cent sulfanilamide in diet and controls on same diet.

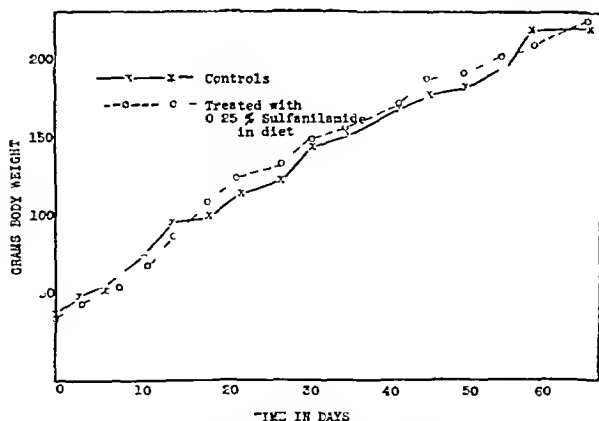


Chart 2—Average growth curves of young rats treated with 0.25 per cent sulfanilamide in diet and controls on same diet.

while the other group received the same food containing 0.25 per cent of sulfanilamide. The rats were weighed at appropriate intervals and the food consumption determined. Calculation from the average food consumption shows that each rat received on an average from 0.16 to 0.35 Gm per kilogram of sulfanilamide daily. The average growth curves of the two groups are given in chart 2. At the end

ACIDOSIS

The hyperpnea observed in dogs given large doses of sulfanilamide suggested that acidosis might be present, as injections of 0.1 Gm per kilogram of the drug intravenously into anesthetized dogs produced no effect on respiration. Samples of arterial blood were taken over mercury from the femoral artery of unanesthetized dogs before and at various intervals after giving sulfanilamide by mouth. Urine was obtained at various times by catheter. The pH of the blood was determined by the glass electrode at room temperature and, as a correction, 0.05 subtracted to convert the values to 37 C. The pH of urine was also determined with the glass electrode. Suitable precautions were taken to prevent escape of carbon dioxide from blood or plasma, but the only precaution taken with urine was to make the determination immediately after it was withdrawn. The pH of the alkaline urine is therefore slightly too high.¹⁴ The carbon dioxide content of plasma was determined in the case of dog 21 but in dogs 19 and 20 the carbon dioxide content of whole blood and the oxygen capacity were determined and the carbon dioxide content of plasma calculated.

Tables 3 and 4 give the results on three dogs. A survey of the data in these tables shows that 17

administration of 1 or 2 Gm per kilogram of sulfanilamide produces a decrease in p_{H} , a decrease in carbon dioxide content of true plasma, and an increase in p_{H} of the urine. Although care was taken to draw blood when the animals appeared quiet and respiration normal, the figures appear to indicate that this was not always successful and that some of the changes encountered are due to respiratory disturbances. However, it seems clear from the figures reported that a definite acidosis due to alkali deficit is produced.

EFFECT ON BLOOD PICTURE

The effects of large repeated doses of sulfanilamide on the blood picture were investigated in two dogs and four rabbits. The results are given in tables 5 and 6. It is seen that no consistent effect is produced on the red or white cell count or on the differential count. Chen³ has found that the intravenous injection of 0.067 Gm

TABLE 3—Effect of Sulfanilamide on Acid-Base Equilibrium in Dog P21

Date	Time	Blood p_{H}	Plasma CO	Urine p_{H}
4/21/37	10 00 a m	7.40	36.0	7.0
	10 15 a m	1.0 Gm per Kg sulfanilamide		
	3 30 p m	7.46	38.5	8.3
4/23/37	10 00 a m	7.20	39.0	6.8
	10 15 a m	1.0 Gm per Kg sulfanilamide		
	12 45 p m	7.18	41.0	7.9
5/ 4/37	3 45 p m			7.4
	10 00 a m	7.45	48.0	6.5
	12 00	7.50	55.2	7.0
5/ 6/37	12 10 p m	0.5 Gm per Kg sulfanilamide		
	3 30 p m	7.40	41.7	7.4
5/ 7/37	10 00 a m	7.46	47.8	6.0
	10 15 a m	1.0 Gm per Kg sulfanilamide		
	3 00 p m	7.37	35.7	8.1
5/ 7/37	11 00 p m	7.36	44.5	5.9
	3 30 p m	7.42	49.8	

TABLE 4—Effect of Sulfanilamide on Acid-Base Equilibrium

Date	Dog	Time	Blood p_{H}	Plasma CO Vol %	O ₂ Capacity, Vol %
4/19/37	P 19	11 00 a m	7.42	51.7	23.6
		11 10 a m	1.0 Gm per Kg sulfanilamide		
		3 00 p m	7.34	40.5	20.4
4/21/37	P 20	11 00 a m	7.41	44.8	19.8
		11 15 a m	2.0 Gm per Kg sulfanilamide		
		2 00 p m	7.37	27.8	22.8
4/22/37		11 00 a m	7.40	32.4	21.0

per kilogram of sulfanilamide in rabbits five times weekly for about a month causes no significant change in the red count, white count, hemoglobin or differential count.

EFFECT ON RENAL FUNCTION

Owing to the fact that the urinary excretion of sulfanilamide in the first few hours is less after intravenous than after subcutaneous or oral administration, consideration was given to any deleterious effect which the drug might have on renal function. Two dogs were given several doses of 1 Gm per kilogram on various occasions and the urine examined for protein, sugar and sediment before and after. Three other dogs received 0.1 Gm per kilogram on many occasions over a period of several months and had urine examinations during this time. No changes indicating any effect on the kidney were found. The two dogs receiving 0.2 Gm per kilogram daily for several months showed no changes in the urine during the experiment and had

normal kidneys at autopsy. The rats receiving sulfanilamide in their food for long periods had no pathologic changes in the kidneys. In the course of certain experiments on the renal excretion of sulfanilamide¹⁵ the creatinine and sulfanilamide clearances were measured after administration of creatinine and various doses of sulfanilamide by mouth. The admin-

TABLE 5—Blood Counts in Dogs

Date	Dog	Red Blood Cells (per C mm) $\times 10^6$	Hemoglobin, Gm per 100 Cc	White Blood Cells	Reticulocytes	Differential Count per Cent				
						Polymorpho nuclears	Lymphocytes	Mononuclears	Basophils	Eosinophils
4/19/37	P 19	7.8	17.4	10 800	0.4	75	13	12	0	0
4/20/37		5.0	13.6	16 500	0.4	80	11	9	0	0
4/21/37		5.7	15.8	20 000	0.2	94	5	1	0	0
4/23/37		5.9	12.3	10 200		77	10	9	0	0
4/26/37		6.2	14.9	20 300	0.0	77	12	10	0	0
4/21/37	P 20	7.8	14.6	22 400	0.0	84	6	6	0	0
4/22/37		8.2	16.5	16 700		88	10	4	1	0
4/26/37		6.0	13.5	18 700	0.0	88	1	11	0	0

P 19 received 2 Gm per Kg on 4/15, 1 Gm per Kg on 4/16, 2 Gm per Kg on 4/19 and 1 Gm per Kg on 4/20 of sulfanilamide. Total 6 Gm per Kg in five days.

P 20 received 2 Gm per Kg after first blood 1 Gm per Kg on 4/24 and 4/26. Total 4 Gm per Kg in four days.

istration of 0.5 Gm per kilogram of the drug markedly depressed the clearances of both substances as well as the rate of urine flow, but a return to normal occurred in about one hour, and a few days later the creatinine clearance was normal. A dose of 0.3 Gm per kilogram did not produce this effect. A dose of 2 Gm per kilogram caused a marked decrease in rate of urine flow and sulfanilamide clearance for more than six hours, but a return to normal occurred within twenty-four hours.

TABLE 6—Blood Counts in Rabbits

Date	Rabbits	Red Blood Cells (per C mm) $\times 10^6$	White Blood Cells	Reticulocytes	Differential Count per Cent				
					Polymorpho nuclears	Lymphocytes	Mononuclears	Basophils	Eosinophils
4/ 1/37	R 17	6.5	14 900		64	24	9	0	0
4/ 3/37		4.7	18 200		73	19	6	2	0
4/ 1/37	R 18	7.2	13 800		63	23	12	0	0
4/ 3/37		5.7	16 300		82	13	3	2	0
4/ 5/37	R 20	6.3	4 200		87	9	2	2	0
4/27/37		6.9	9 600	0.3	53	40	4	2	1
4/30/37		7.8	4 800		65	25	6	4	0
5/ 5/37		6.8	8 300		48	32	20	0	0
4/27/37		5.2	10 500	0.5	57	27	11	4	1
4/30/37	R 26	3.6	6 000		68	25	5	0	2
5/ 1/37		4.8	8 500		77	18	5	0	0

Rabbits R 17 and R 18 received 1 Gm per Kg after first count 1, and 1 Gm per Kg on 4/2 and 4/3. Total 3.5 Gm per Kg in two days. Both animals died on 4/5.

Rabbits R 20 and R 26 received 1 Gm per Kg on 4/27, 4/28, 4/29 and 4/30. Total 4 Gm per Kg in four days.

Two dogs were given 5 Gm per kilogram of sulfanilamide in the course of four days. Tests of their efficiency in excreting sulfanilamide made before and a week after the administration of these large doses were practically identical, no abnormalities of the urine were seen. One of these animals was killed.

¹⁵ Marshall E. K. Jr. Emer on Kendall Jr. and Cutting W. C. *J. Pharmacol. & Exper. Therap.* 61: 191 (Oct.) 1937.

and sections of the kidney were examined. With the exception of some vacuolization of the luminal surfaces of some of the cells of collecting and Henle loop tubules, no abnormality was found. Sections of the kidneys of a dog dying forty-eight hours after a dose of 2 Gm per kilogram of sulfanilamide showed a similar picture. Nine mice dying from 4 Gm per kilogram of sulfanilamide and two dying from 4 Gm per kilogram of the acetyl derivative had normal kidneys on microscopic examination.

It seems probable that this temporary effect on the kidney is due to a decrease in glomerular filtrate, produced probably by a decreased blood supply to the kidney. It does not indicate any permanent renal damage. However this temporary effect probably explains why after intravenous injection less sulfanilamide is excreted during the first hours than after subcutaneous or oral administration.

COMMENT

The data reported for mice, dogs and rabbits indicate that the acute toxicity of sulfanilamide is comparatively small but that the substance in very large doses is toxic. As far as our limited experiments go, they give no indication of chronic toxicity for dogs or rats. No pathologic changes in organs have been observed. The acetyl derivative to which the substance is partly changed in man¹⁸ is more toxic than sulfanilamide. Owing to its poor absorption when given in large doses by mouth, the toxicity of the acetyl-sulfanilamide is much underestimated on oral administration. A lower concentration of this substance in the blood than sulfanilamide produces toxic symptoms.

The median lethal dose ($M L_{50}$) of sulfanilamide for man is unknown and it is impossible to deduce it from animal experiments. However, it is probable from what is known of the effect of sulfanilamide on patients that the drug is more toxic for the human being than for the animals used in these experiments. With the inevitably greater individual variation in susceptibility exhibited by diseased human subjects than by normal laboratory animals, one may expect severe toxic effects in the occasional hypersensitive human subject from the comparatively large therapeutic doses used. The acetyl derivative is present in comparatively low concentration in the blood of patients receiving the drug, but should an occasional individual acetylate much more of the drug than the average, toxic symptoms might result from this cause. Since the drug is excreted more slowly than normal in conditions of decreased renal function,¹⁰ care should be exercised in its administration in such cases.

Already, certain toxic effects have been reported to occur in patients from the administration of sulfanilamide. It is important to determine whether these are reactions to the inherent toxicity of the drug or cases of real idiosyncrasy. Sufficiently large doses of almost any drug will cause a toxic manifestation in all persons and in a few cases this response is produced by a small therapeutic dose. Such individuals are sensitive or hypersensitive to the drug in that a common response is produced by an abnormally small quantity of the drug. On the other hand, when a patient shows a response of an abnormal character not given by other patients after very large doses, this response may be termed idiosyncrasy. The cerebral symptoms (dizziness, nausea, headache, excitement and confusion), the acidosis and the cyanosis appear to be direct toxic

effects of the drug, while the acute hemolytic anemia¹ and the possible agranulocytosis¹ must at present be regarded as idiosyncrasies. Too little is known about the fever¹⁸ and skin rashes¹⁹ to attempt to classify them at present. On the basis of our animal experiments, it would appear that the direct toxic effects reported in man are initial stages of intoxication. Whether or not these toxic effects will occur in a patient, their intensity, if present, will depend on the susceptibility of the individual patient and the dose of the drug used. The idiosyncrasies so far reported are, of course, extremely serious.

The cerebral symptoms shown by man are similar to those produced by large doses in dogs and would be expected in man with smaller doses. The decrease in carbon dioxide combining power of the plasma in man has been interpreted by Southworth⁹ as due to acidosis, but Basman and Perley,²¹ observing the same decrease with alkaline urine, believe the condition to be alkalosis due to hyperpnea. Without a determination in man of two of the three variables (carbon dioxide content, carbon dioxide tension and hydrogen ion concentration) concerned in the acid base equilibrium of blood, one cannot be sure that the condition in man is acidosis except from analogy to our experiments on dogs and the fact that administration of alkali relieves the symptoms. In dogs it seems clear that acidosis is produced by large doses of the drug and this is evidently due to an alkali deficit. The very alkaline urine with coincident loss of large quantities of bicarbonate and base certainly plays a role in the production of the acidosis and may be the main cause. It is possible that this may be due to lack of reabsorption of bicarbonate and base from the glomerular filtrate, the reabsorption of a large amount of the filtered sulfanilamide¹⁵ interfering with that of bicarbonate.

In spite of the fact that this study indicates that sulfanilamide is a relatively nontoxic substance, the drug is not devoid of toxicity. The minor toxic manifestations to be expected in man from our animal work and from the greater individual variation in diseased patients would seem to be no contraindication to the use of the drug when definite therapeutic indications exist. However, owing to the fact that the drug can possibly produce serious toxic symptoms in a hypersensitive individual as well as the known occasional idiosyncrasy of a serious nature, sulfanilamide should not be used indiscriminately.

SUMMARY

1. A study of the acute toxicity of sulfanilamide has been made on mice, rabbits and dogs. The toxicity of the drug for these animals appears to be relatively small, but the substance is not devoid of toxicity.
2. Limited experiments on dogs and rats have shown no signs of chronic toxicity and no pathologic lesions in these animals after prolonged administration of sulfanilamide.

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3 Acetyl-sulfanilamide, to which sulfanilamide is partly converted in the human being, is somewhat more toxic than sulfanilamide

4 An acidosis is produced in dogs from the administration of large single doses of sulfanilamide

5 No effect on the blood picture of dogs or rabbits was observed from the administration of large doses of the drug for several days

6 A temporary decrease in renal function is observed after giving large doses of the drug, but no permanent kidney injury appears to result

AN EVALUATION OF THE SAFE PERIOD

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In spite of the fact that scientific proof of the validity of the fertility-sterility rhythm in woman is incomplete, the method of periodic continence presented a welcome alternative for the objectionable birth control methods. Complete confidence in the efficacy of the safe period principle, however, is not shared by all.

The theory of a fertility-sterility rhythm presupposes that in the sex cycle of woman there is a sterile or "safe period." This is based on the conception of regular menstruation with a fixed or estimable time of ovulation which can be readily reduced to a workable plan for the average woman. In arriving at this rhythmic principle three important factors are considered as basic, namely, (1) the phenomenon of ovulation and the time of its occurrence in woman, (2) the life span and fertilizability of the ovum and (3) the role of the spermatozoon.

In order to establish the exact ovulation time in women, several tests have been devised and analogous biologic observations have been cited. Knaus, one of the originators of the rhythm theory, through an ingenious method determined to his own satisfaction that ovulation always occurs fifteen days before the next menstrual period at the same time defining the corpus luteum phase as the last two weeks of the cycle. This method, which utilizes solution of posterior pituitary, is familiar to all students of sex physiology, and, while the work of Hermstein¹ is for the most part confirmatory to that of Knaus,² there are a number of recognized authorities who have attempted but failed to corroborate Knaus's results. Among the latter, the work of Moir³ is especially significant, as it reveals opposite results from those of Knaus. Moir found that, in testing the nonpregnant uterus with solution of posterior pituitary, contractions occurred at every stage of the cycle, whereas the basis for the Knaus test is the absence of uterine response to pituitary stimulation during the corpus luteum phase. In addition, Wittenbeck,⁴ Schultze,⁵ Tachezy⁶ and Morgan repeated the experiments of Knaus with contradictory results. In Schultze's series, for instance, twelve out of thirty

patients responded strongly to solution of posterior pituitary in the second half of the twenty-eight day cycle, the period that showed no contractions in Knaus's experiments. Furthermore, Tachezy observed the most pronounced reaction during the second half of the cycle in his experiments. For analogy, it is interesting to note that both in rabbits and in monkeys the uterus responds to solution of posterior pituitary with powerful contractions during the corpus luteum period (Hartman⁷).

Another method of determining the time of ovulation has been devised by Allen, Burr and Hill,⁸ known as the electric potential method, by which sharp rises at the time of ovulation and fall after ovulation may be recorded. This may prove of great value in settling an important question now under fire if their experiments on rabbits can be duplicated in the human being with like results.

After determination of the period in the cycle in which the egg is available, further consideration must be given to the length of time that it is fertilizable. It is highly probable that the ovum does not survive more than twenty-four hours after its liberation from the graafian follicle, and it is possible that it is fertilizable for but a few hours. In the few human ova that have been recovered at operation, it was observed⁹ that degenerative changes occur rapidly after extrusion in which an albuminous coat forms about the ovum, acting as a barrier to the penetration of the spermatozoa. More or less controversy exists concerning these and other facts pertinent to the mechanism of conception, which tends to upset the dogmatic position of Knaus, who believes that conception can occur only in the days represented by three days before, during and one day after ovulation, that ovulation occurs only on the fifteenth day before the next menstruation, and that a single ovulation occurs in each cycle. There are many observers, for instance, who doubt that ovulation bears this constant relationship to the menses and no few who believe that extracyclic ovulation may occur. We recently published evidence of multiple ovulation from the study of sections of the human ovary in a paper pertaining to this subject. Even Ogino,¹⁰ who is dogmatic in his view of a restricted and single ovulation in the cycle, quotes Hensen (1881) and Chasan (1911), who believe that traumatic ovulation occurs in the human being, a view also accepted by Bolaffio.¹¹ Stockard and Evans¹² previously admitted the probability of the occurrence of extracyclic ovulation. Bolaffio is one of those who agree with Wittenbeck and others that ovulation time varies, for in his studies he observed the peak of conception to occur on the seventh or eighth day of the cycle. He believes that ovulation in some instances occurs in the immediate premenstrual or postmenstrual phases and that it may occur either spontaneously or as a result of trauma (coitus). Schumacher¹³ cites actual cases in substantiation of the lat-

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5 Schultze C. K. F. *Zentralbl. f. Gynak.* 55: 3042 (Oct. 17) 1931.

6 Tachezy R. *Zentralbl. f. Gynak.* 55: 2663 (Nov. 10) 1934.

ter view, which he can explain only on a basis of induced ovulation at the time of coitus, or on unreasonably long survival of gametes. In addition, Grosser observed ovulation to occur seven times before the fourteenth day and three times between the fourteenth and sixteenth days (optimal) and thirteen times after the sixteenth day in his carefully recorded series wherein accurate dates of menstruation and coitus were known. More significant still is the report of Weinstock,¹⁴ which tends to prove that the former ideas summarized by Dickinson¹⁵ about ten years ago regarding conception time are clinically correct. Weinstock reported her observations on 416 cases of single coitus resulting in pregnancy, which revealed that conception occurred at all times of the menstrual cycle regardless of length. When similar reports have been published in the past, critics have doubted the accuracy of the observations, have doubted the probability of a single coitus. Clinicians have recognized for ages that variations of fertility in the menstrual cycle exist and that a peak in fertility occurs at the midperiod of regular cycles. Similarly, Dickinson concluded from a critical study of available data that although there are maximal and minimal phases of the cycle there is no safe period for women in general. Conceptions, he found, were recorded in the premenstrual (or sterile) week in about 10 per cent of the cases and even during menstruation (13 per cent). More recent studies directed to the establishment of ovulation time were published by Fluhmann,¹⁶ who examined the estrogenic hormone in the blood at various phases of the cycle. His results indicate that the corpus luteum phase is not always fifteen days, as he found that in the twenty-five to thirty day cycle the hormone peak was reached from the seventh to the sixteenth day, and in the thirty-one to forty day cycle anywhere from the fourteenth to the twenty-fourth day.

In addition to the studies incident to the ovum, similar observations concerning the life and fecundity of the spermatozoa must be considered. Knaus believes that the fertilizing power of male gametes is less than two days, and Ogino three days, while Hartman expressed the view that the unfertilized egg lives but a few hours, the sperms mostly less than a day, and therefore that fertile coitus and fertilization (conception) are almost synchronous. It is generally conceded that though human spermatozoa may be found alive in the pelvic structures of woman for as long as from two and one-half to three weeks (Nurnberger) the period of fertilizability of the male as well as of the female gamete is short, probably not more than three days.

Ogino's conclusions from clinical observations dovetailed with the more basic work of Knaus. These two gynecologists worked simultaneously, although entirely independently, and arrived at similar conclusions by almost opposite routes. They revealed a common interest in the determination of ovulation time, agreed very closely in the results of their endeavors, and published a conviction in a fertility-sterility rhythm in women. Ogino's conclusions were drawn from his observations on patients at laparotomy. He found no unruptured graafian follicles later than eleven days or earlier than sixteen days before the beginning of the next menstrual period. Corpora lutea in various stages were also observed by Ogino from the first to the eleventh day before the period. From this and confirmatory clinical

data, he concluded that ovulation always occurs between the twelfth and sixteenth days before the succeeding menstrual period and that the eleven days before the menses are sterile. There are indeed definite difficulties in judging the age of corpora lutea either by gross or by microscopic methods, and as much may be said concerning the graafian follicles. Even when observation of the ovary made at operation are correlated with the interpretation of endometrial strips, according to Shaw,¹⁷ the resulting calculation of ovulation time is not free from errors. Hartman questions the gynecologist's ability to judge the age of the corpus luteum and he feels that it is likewise unjustifiable to predict ovulation time in women. Nevertheless, Hartman, as a result of his own epochal investigations of the sex cycle in the monkey, favors the Ogino-Knaus theory in the human being. He has demonstrated that there is a safe period in the macaque (Rhesus) and he believes that as new data accumulate the opponents of the rhythm theory are placed more and more on the defensive. Hartman's work is indeed the strongest evidence favoring the rhythm theory yet presented, but the question arises as to whether it is applicable to human beings. His work is on monkeys—monkeys in captivity—out of their natural environment. Hartman made several hundred observations on ovulation time utilizing the following methods: first, that of isolated coitus and recording the resulting conceptions, second, repeated digital (rectal) palpation of monkey ovaries, recording no less than 200 ovulations and checked by laparotomy. In half the cases a comparative study of removed eggs or embryos was made to check further the palpatory examinations. He found ovulation to occur between the eighth and twentieth days of the cycle, irrespective of the regularity of the cycle. This is of particular interest in the light of Ogino's criticism of the laparotomy observations and deductions of Fraenkel,¹⁸ Schroeder and others that they estimated ovulation from the preceding rather than from the subsequent menstruation. Ogino states dogmatically that ovulation always occurs from twelve to sixteen days before the next menstrual period.

THE MENSTRUAL CYCLE IN WOMAN

It may be assumed, in view of the data recorded in the foregoing paragraphs, that ovulation occurs about two weeks before the onset of menstruation. If this is true, and a single ovulation occurs in the cycle, there should be a sterile or safe period from two days after ovulation to within three days before the next ovulation—in the following menstrual cycle. This is the fundamental concept of the Ogino-Knaus theory. The practical application of this theory depends on regularity of menstruation, it is required that a record be kept from eight to twelve months in order that the ovulation time and the safe period may be calculated. In a routine medical interview most women, when asked, state their belief that their menstrual periods are regular. Many state that they follow a twenty-eight day cycle and others claim to menstruate on the same day each month. The inaccuracy of such observation becomes quite evident when a method of careful recording is instituted, such as employing the calendar method, in which the dates of onset and cessation of the flow are noted each month. In June 1935 we¹⁹ called the attention of the members of the Chicago Gynecological

14 Weinstock F. Zentralbl. f. Gynak. 58: 2947 (Dec. 15) 1934.
15 Dickinson R. L. Am. J. Obst. & Gynec. 14: 718 (Dec.) 1927.
16 Fluhmann C. F. Am. J. Obst. & Gynec. 27: 73 (Jan.) 1934.

17 Shaw W. Brit. M. J. 1: 7 (Jan. 6) 1934.
18 Fraenkel I. Zentralbl. f. Gynak. 35: 1591 1911.
19 Stein I. F. Am. J. Obst. & Gynec. 30: 710 (Nov.) 1935.

Society to the desirability of collecting accurate data concerning the sex cycle of their patients. Shortly thereafter, adopting a calendar card patterned after one used at the University of Minnesota, we instituted this plan in our own private practice as well as in a training school for nurses. On collecting the calendars for 1936—some of which were incomplete—we were greatly surprised to find how very few really regular cycles there were. In fact, a regular irregularity is the rule, an observation which has been noted previously by others. Holt goes so far as to state that the idea of regularity of the menstrual cycle in women is a myth, as he did not find a single instance of menstrual regularity in his series of carefully recorded cycles for a period of four years. Furthermore, Dr Hannah Stone,²⁰ who summarized the data from 400 calendars distributed by the Birth Control Research Bureau, stated that the outstanding feature observed was a definite irregularity of the period. Only a few of the 400 women had regular twenty-eight day periods and others showed variations of from one to fifty-one days.

Emge²¹ comments on the clinical observations of Miller and of Latz,²² who reported no failures with utilization of the "safe period" principle of birth control in 2,200 and 1,702 cohabitations respectively, with the statement that the real stumbling block to the rhythm is the common irregularity of the menses, as he believes that variability is the rule rather than the exception. Additional evidence to this effect is furnished by Fluhmann, who published accurate data collected from seventy-six healthy young California women, representing 747 menstrual cycles. His observation revealed a range of variability between eleven and 100 plus days, with a mean of thirty days. About one third of the women were regular within a five day range, and two thirds were markedly irregular. Fluhmann found it impossible to classify them in definite types because of the variation in the individual cycles. Westminster similarly found most women irregular, and Fraenkel stated that the only regularity about the menses is their irregularity.

Ogino reports that most Japanese women menstruate every thirty-one days, with a variation of from twenty-six to thirty-four days. He also quotes some authorities who observed a high percentage (80 per cent) of regular twenty-eight day cycles. These statistics, however, were obtained before the accurate calendar method was invoked and doubtless were examples of the kind of data obtained from usual history-taking technic. He also quotes the statistics of Obata, who used the calendar method with 964 students in whom he found only 07 per cent regular, 10 per cent with a variation of from one to three days, and 56 per cent with a variation of more than eleven days, but he apparently disregards the significance of these data. If Ogino's theory that the safe period technic is applicable to women who vary within ten days, only 44 per cent of Obata's group would qualify.

A summary of the data from our own calendars coincides more or less with the observations of Fluhmann, Obata and others, revealing a predominance of irregular cycles. We collected 115 calendars for 1936 forty-five of which were kept by our office gynecologic patients, many of whom applied for contraceptive advice, and seventy calendars were kept by young single women

attending a training school for nurses. The heterogeneous group in office practice, including forty married and five single women, failed to return a single calendar recording a regular twenty-eight day cycle. Nor was there a regular cycle of any other number of days. The other group revealed practically the same lack of pattern, for while one out of the seventy calendars showed several thirty day periods, only four months were recorded, which was too short an observation to determine whether irregularities occurred during the year. The accompanying table is a summary of these two groups, revealing that the menstrual cycle is regularly irregular. In the nursing group thirteen of the seventy cycles varied within four days, twenty-nine varied within seven days and forty-one varied from eight to 115 days. In the total 115 women ranging in age from 18 to 40 years, the menstrual pattern, if such exists, is one of uniform irregularity. Less than 20 per cent fall into the class of regularity defined by proponents of the rhythm theory, who accept a variation of four days in regular cycles, and 56 per cent would be flatly disqualified. In this larger group there were those who were regularly irregular, those occasionally irregular, and others experiencing periods of amenorrhea.

Summary of Calendars

Office Patients	Cycle Variations	Single Women
3	1 day	1
0	2 days	1
2	3 days	5
4	4 days	5
4	5 days	2
2	6 days	7
6	7 days	7
24	8-115 days	41

The menstrual variations that were observed by us were usually not attributable to ill health or demonstrable disease but often appeared to occur as a result of psychic influences. Anxiety concerning a sick husband or child, fear of undesired pregnancy, worry over finances, change of environment and climatic differences seemed to play a major role. This becomes especially evident in a hospital when young women first enter a training school for nurses. It is not uncommon for many such young women who menstruated normally to experience periods of amenorrhea of from two to seven or more months following their matriculation. This was not restricted to those women who traveled great distances, as is popularly believed but also occurred in those who came from within the state or nearby. Climate is not so potent an inhibitory influence, we believe, as is the psychologic effect of entering the hospital environment. The feeling of awe, with more or less apprehension, which most girls experience on first becoming identified with the hospital atmosphere, is sufficient to affect various bodily functions profoundly, including the menstrual cycle. It is commonly recognized that the more profound psychic traumas such as shock or sudden bereavement may produce an inhibitory effect on the menses, and there are differing opinions concerning the regulating mechanism involved therein. This phase of influence and control of the sex cycle was recently explained by Theobald²³ in the *British Medical Journal* in a significant paper on "A Center or Centers in the Hypothalamus Controlling Menstruation, Ovulation, Pregnancy and Parturition." He believes that the center, which probably lies in the hypothalamus, receives efferent impulses from (a)

²⁰ Stone, Hannah. In discussion on Hartman J. Contraception 25, (March) 1937.

²¹ Emge, L. A. West J. Surg. 44, 28 (Jan) 1936.

²² Latz, L. J. The Rhythm of Fertility and Sterility in Women Chicago: Latz Foundation 1934.

²³ Theobald, G. W. Brit. M. J. 1, 1038 (May 23) 1936.

the ovaries, (b) the external genital organs and (c) the special senses or psyche. These efferent impulses operate, he says, through (1) the anterior pituitary gland and (2) the nervous impulses to the sex organs. He cites examples of irregularities and periods of amenorrhea produced by such inoffensive psychic traumas as diving into cold water or mere immersion in hot or cold water during the menses if unaccustomed to do so. Hypnosis, morphinism and fear of pregnancy, as well as climatic and environmental changes are mentioned by Theobald in this connection. He similarly observed the effect on nursing groups which we just mentioned, explaining the periods of amenorrhea on the basis of the psychic effect of entering the strange and appalling atmosphere of the hospital, and observed that a mere threat of a gynecologic examination was sufficient in some cases to remove the inhibition. He also described a case in point wherein the proximity of the husband and the fear of pregnancy caused a two to three months irregularity in the wife's menstrual cycle, when she was separated from the husband for several months, the menses became regular. That severe shock and great excitement may result in amenorrhea is recalled by Theobald and is a view more or less widely accepted by physicians in general. Ogino, however, who believes that women menstruate regularly, reports that the great Japanese earthquake in 1923 had no effect on the menstrual life of the Japanese women. If this is true, it is quite evident that the Japanese are emotionally different from American, English and European women.

BRIEF SUMMARY, PRO AND CON

At the present time endorsement of the "safe period" is indeed hazardous, for if the facts supporting and those refuting the theory are reviewed, one discovers much data still in controversy. In summary the statement may be accepted that the fertilizing ability of the spermatozoa lasts not longer than three days and that the availability of the female gamete is less than two days, although in the case of the human being there is still no proof. Our concern is mainly with the facts of ovulation, does it occur regularly, does it occur singly, and can its occurrence be predicted? The determination of ovulation by the Knaus test with solution of posterior pituitary has been but partially confirmed by Hermstein. Moir and others who repeated Knaus's experiments failed to substantiate his observations. The criticism has been made that these observers were dealing with cases of anovulatory bleedings without the corpus luteum phase, but this seems to us unlikely. That there is a single ovulation in the cycle is the basic premise on which Ogino and Knaus built their theory, on the other hand, extracyclic and multiple ovulations have been described in the human being by various observers. Regarding the second method to determine ovulation time, that of laparotomy study, Ogino delimited ovulation between twelve and sixteen days before the ensuing menses. Shaw confirmed this but Fraenkel, Meyer and Ruge and others showed great variations in ovulation time. The method depends on a diagnosis of the age of a follicle or corpus luteum, but, as Hartman pointed out, there are no established criteria by which such a diagnosis could be accepted as scientifically accurate. Even when such observations have been combined with microscopic study of endometrial strips, the results were inconclusive.

Fluhmann's hormone determinations fail to support the idea of a constant ovulation time in relation to menstruation. Additional data might be presented con-

cerning midinterval bleeding, mucous discharge, mid-month pain, or the rhythms of desire and well-being which would only tend to confuse the issue and may add little to scientific fact. Hartman's comparative work in monkeys lends great support to the rhythm theory. We accept his statement that there is a safe period in the monkey, but from this can one infer that there is a safe period in the human being? Hartman himself states that though there probably is a safe period in some women the theory cannot be safely applied in its present state. According to the author of the rhythm theory, in order to determine the safe period a record of past performance in the form of a menstrual calendar is a necessity. A fair measure of menstrual regularity must be present. Holt, Weinstein, Fluhmann, Stone and we have presented evidence that the menses are grossly irregular. The idea of a safe period presupposes a fertile period of but a few days duration in approximately the midperiod. However, data have been presented by Dickinson, Weinstein and others to the effect that conceptions have occurred at any time of the cycle and even during menstruation.

The real test for the efficacy of the safe period theory lies in clinical trial, and a final evaluation will wait the success or failure as reported in the literature. Unfortunately such reports are only too few. Latz, who has done most to publicize rhythm in this country, reported a very small percentage of failures in his original presentation, but in a recent publication he cites fifty-nine failures among 324 women, most of which he attributed to factors that may be found in everyday life. He states that fifty-seven of these were not due to defects in the method but to faulty application—a high degree of misapplication. Knaus also was able to prove that in all reported failures coming to his notice he was able to point out errors in the application of the safe period rather than in the theory itself. It seems to us that there is sufficient reason for the condemnation of this system of birth control because the method is so complicated that the average gynecologist has difficulty in instructing his patient and because the patient misinterprets to so great a degree the required restrictions.

The most glowing report of success in the American literature is that of Miller, Schulz and Anderson,²⁵ who report no failures in a series of 725 cohabitations among eighty-seven couples. On the other hand, recent reports of failures in the hands of specialists are numerous. Slamova²⁶ reports eight failures in one year, four of which were pregnancies resulting from coitus in the premenstrual or so-called sterile week. Emge states that he has had failures even in the small group which he has had the opportunity of observing and he quotes Fetscher²⁷ as also reporting failures with the safe period method. Schumacher reports three failures. Weinstein and Manulkin²⁸ cite conceptions occurring at all times of the cycle except the last four days in the latter's report. To sum up, in view of the fact that there are so many reports of failure and so few of successful application, can it be that the Ogino-Knaus theory, although apparently a simple rule of thumb, is in reality so difficult to apply that its use must be restricted to a certain favored few?

24	Latz L J	and	Reiner E	Illinois M J	71	210	(March)	1
25	Miller A G	Schulz C H	and	Anderson D W				
	Gynec & Obst	56	1020	(June)	1933	GO	1407	(June 13)
26	Slamova B	Zentralbl f Gynak	60	812	(May)			
27	Fetscher R	Deutsche med Wchnschr	60	812	(Jan 4)			
28	Manulkin A E	Zentralbl f Gynak	60	15	(Jan 4)			

COMMENT

The idea of a fertility rhythm or even of a safe period is not new. As a matter of fact, it extends far back into medical literature. The more recent investigations of Ogino and Knaus, however, reawakened an interest in the subject, and the promotion of the safe period idea by Latz gave great promise of a simple, acceptable and practical method of family limitation. We have omitted more or less of the older data, much of which are indeed significant, and have for the purpose of this evaluation limited ourselves to the more recent and pertinent contributions to the subject.

It may be assumed that there are some women in whom a safe period exists. The difficulty lies in the vast amount of scientific data pointing to the variability in ovulation time and of possible multiple ovulations in the cycle, and the inability to identify the safe period for most women. In our own series less than 20 per cent menstruated regularly enough to be candidates for safe period instruction. Furthermore, these women, constituting the 20 per cent of our patients, according to the Latz-Reiner contraindications must omit the method after confinement or miscarriage, after severe illness, shock or drastic alterations in the routine of life. In our present economy there are even more circumstances that affect the regularity of the menses through psychologic causes than those already mentioned.

While the monkey observations of Hartman tend to throw bright light on the sex cycle of woman, the freedom from psychic influences and the different environment of this primate renders these observations inapplicable. Have psychologists noted the menstrual changes in monkeys due to change in climate, fright, anger, economic stress and the like that have been demonstrated in women? If so, it has escaped our notice.

If the practice of birth control requires a measure of restraint and cooperation, the adoption of the safe period principle presupposes the acme of self control, because it not merely imposes the interposition of certain devices at an inconvenient time but makes abstinence during periods of desire imperative. Furthermore, there are so many environmental and emotional influences in our daily lives that are known to affect menstruation (or ovulation, which controls menstruation) that we believe that the safe period estimate by the calendar method is not practical.

In a recent critical study of the available data from the literature, Emge virtually agrees with Dickinson's earlier conclusions that maximal and minimal periods of fertility do exist but that unexpected irregularities may occur at any time in the cycle, which tends to throw doubt on the infallibility of the safe period. We are in full accord with these views.

The very people who most need a fairly fool-proof method of child spacing or contraception for medical indications, or because of poverty, low mentality or inheritable criminality are those who may be least of all relied on to keep an accurate record of menstruation and least able to exercise the self control needed for periodic continence. As stated in a previous paper on this subject, we believe that the calendar method is adequate for recording menstrual data for literate women, a small percentage of these women will find the safe period satisfactory for their beliefs and their mode of living. However they must be made to comprehend the risks involved. A combination of the safe period principle and the use of a known effective spermicidal jelly during the less fertile phases of the

cycle has been advised by us for certain women who fear reliance on either method alone.

The appearance of this so-called Ogino-Knaus theory has stimulated a vast amount of clinical and biologic investigation. The promulgation of a practical method of conception control based on the "safe period" idea has been the fruit of these endeavors, in our opinion the fruit is not yet ripe enough for general consumption.

IRRADIATION AS AN AID TO SURGICAL TREATMENT OF CANCER OF THE BREAST

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Since Halsted¹ and Willy Meyer² described the radical operation for the cure of cancer in 1894, surgeons throughout the world have studied the problem with renewed interest. Other surgeons increased the scope of the procedure so as to include more axillary skin and supraclavicular glands. Some surgeons, who were inclined to evaluate too highly the cosmetic result or who did not appreciate fully the pathology of cancer of the breast, removed too little skin and left in place one or both pectoral muscles. Halsted³ eventually abandoned the supraclavicular neck dissection with division of the clavicle as well as the incision out onto the shoulder. Handley⁴ introduced the wide subcutaneous dissection with emphasis on the deep subcutaneous spread of the disease, in accordance with his theory of lymphatic permeation. As a result, most experienced surgeons have finally settled down to a radical operation that requires the removal of skin at least 5 inches in diameter and a wide subcutaneous dissection, with excision of both pectoral muscles and the axillary contents.

The establishing of the method in general use has provided an opportunity for studying the results in reference to expectancy of postoperative life, frequency and sites of recurrence and functional and anatomic results.

The first result of this study has been the recognition of the futility of operation for cure under certain conditions. When the cancer is fixed to a chest wall, the cutaneous area largely invaded *en cunasse* or in nodules over to the sternum, the axillary glands involved in a bulky mass or the supraclavicular glands involved, the disease has ceased to be a local process and is therefore inoperable except in a palliative sense. These observations are dependent on sight and touch, with all their limitations. Fortunately, roentgenograms have given their aid, so that now a study of the chest, spine and pelvis may be made before operation to pick up evidence of metastases. The roentgen study should be made without regard to the smallness of the primary tumor or the lack of suggestive symptoms. With this aid, many cancers clinically localized have been proved to be diffuse and inoperable.

With these criteria of exclusion, many surgeons have performed radical operations on patients with operable

Read before the Section on Surgery, General and Abdominal at the Eighty Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1937.

¹ Halsted W. S. Ann. Surg. 20: 507 (Dec.) 1894.

² Meyer Willy. M. Rec. 46: 746 (Dec. 15) 1894.

³ Halsted W. S. Developments in the Skin Grafting Operation for Cancer of the Breast. J. A. M. A. 60: 416 (Feb. 8) 1913.

⁴ Handley W. Sampson. Cancer of the Breast. ed. 25. New York: Paul B. Hoeber, Inc. 1922.

cancer The technic has been followed long enough in a sufficiently large number of cases (in different clinics) for one to reach a fair knowledge of results Forty per cent of all the patients operated on may expect a five year freedom from disease, with a small percentage dying of cancer later If the postoperative pathologic study reveals only a localized cancer, over 60 per cent may expect a five year "cure," whereas only 20 per cent remain free from evidence of recurrence for five years when metastases to the axillary glands can be demonstrated by the pathologist

These results prove the necessity for more education of members of the medical profession and of the public to the end that cancer of the breast may be treated when it is still a local disease They demand also the recognition by the surgeon of the necessity for the removal of all tumors of the breast immediately and not after long drawn out observation In my series, 40 per cent of the patients with localized disease died of cancer within five years These results also indicate the weakness of the present methods for detecting metastases pathologically It is obvious that if the disease had been local in fact, radical operation should have cured all the patients

One need admit that results of surgical intervention are not as satisfactory as desired With this realization, surgeons readily turned to roentgen rays and radium for help The great value of these factors in the treatment of certain surface cancers inspired much hope This hope was abetted by the steady improvement in x-ray machines, with ever increasing knowledge of the physics, the biologic reaction and the application of roentgen therapy This statement applies equally to radium therapy

Roentgen rays are now used with sufficiently high voltage and with sufficiently short wavelength to approximate radium in effect They have, furthermore, the advantage of wide geographic distribution of equipment for their use, and they may be used at a relatively low cost They also permit the treatment of many patients daily

Cancer of the breast has the disadvantage of being relatively resistant to irradiation, so that daily treatments over long periods are necessary to obtain sufficient effect on the cells This effect is reached in two ways (1) the destructive action on the cell itself, with consequent disintegration, and (2) the stimulation of fibrous tissue formation, with resulting inclusion of the cells by fibrous tissue, which in turn obliterates the lymphatic and vascular blood supply to the areas involved With cumulative doses one of these two results or both may be obtained, but it is proper to assert that there is no assurance that the tumor cells may not later take on renewed activity

The pathologic process is still a source of difficulty, because of its variable activity and behavior Small tumors may well remain localized, while tumors of similar size may very early send metastases through the chest wall or to the spine Histologic study of the cancer to determine the degree of malignancy has so far been of little help except perhaps in the treatment of the gelatinous tumor These facts illustrate the immediate difficulty that arises in the determination as to what areas of the chest should be subjected to irradiation

Preoperative irradiation has been advocated on the following grounds (1) that the cancer cells are destroyed or devitalized so that they are unable to form new foci if accidentally implanted at the time of the

operation and (2) that the lymph channels which lead away from the tumor are occluded so that emboli to adjacent glands are not possible during the inevitable trauma of operation The procedure is objected to on the following grounds (1) that in cases of tumor of the breast such results cannot be obtained without prolonged treatment, (2) that such treatment damage the skin to such an extent that the operation of necessity must be postponed for two or three months (therapy of less degree, it is now agreed, brings no assurance of any beneficial effect) and (3) the operative repair is retarded because of the vascular damage Any surgeon knows only too well that the diagnosis of possible cancer of the breast is a great mental shock to the patient It is difficult enough to persuade her to submit to a radical operation without asking her to subject herself to prolonged irradiation, with a long wait before operation, even when the provisional diagnosis is fairly certain For the present, I believe that not enough evidence has been brought forward to warrant insistence that the patient submit to preoperative roentgen therapy

Adair¹ has reported on a most worthy and interesting research on the effect of preoperative irradiation on cancer of the breast and on cancer metastases to the axillary glands with roentgen therapy or the 4 Gm radium element pack He noted first a clinical reduction in the size of the primary tumor and second a lesser reduction of the axillary glands

All the 117 patients subsequently underwent operation followed by careful study of the excised tissue In fourteen of sixty-five patients (21.5 per cent) no evidence of cancer could be found although needle biopsy before radiation therapy had confirmed the clinical diagnosis of cancer In only three of thirty-nine cases (8 per cent) in which there was clinical axillary involvement did the pathologic examination fail to demonstrate carcinoma Results with the 4 Gm radium pack were not appreciably different One must remember that in all these cases the cancer cells that were not killed were in all probability devitalized or retarded to a greater or less degree and that therefore there is considerable logic in the attitude of champions of preoperative therapy over postoperative therapy At the same time, it is to be noted that five year observations have not been reported for a sufficiently large group of cases

Postoperative roentgen irradiation has received rather wide support as an aid to radical operation It has been used widely since 1920, so that by this time various sources should provide evidence of its value It is true that each year has brought changes in the apparatus so that higher voltage and shorter wavelength may be used, that filters have changed, that methods of application have varied both in size of field and in type of crossfire and that the dose at each sitting and the frequency of application have changed from time to time Methods have changed so quickly, in fact, that it has become well nigh impossible to check the results in a sufficient number of cases with any given technic To a surgeon who is accustomed to think in terms of five year results, this has been a serious problem Fortunately, various clinics have begun to report their operative results with and without the aid of postoperative irradiation in terms of five years One must be reminded again that the operative technic has become essentially uniform and that the roentgen therapy is

¹ S. Adair, Frank E. and Quimby E. H. *Am J Roentgenol* 33: 13 (March) 1936

that which was in use up to 1931. It was based on cutaneous reaction which amounted to severe erythema. Usually three ports were used: (1) the breast area, including the mediastinum, (2) the axillary region and (3) the supraclavicular space. One or two massive doses lasting from thirty minutes to an hour were given to each port, and the treatment was repeated twice at two or three month intervals. Slight variations from this method were used in various clinics.

TABLE 1—Comparison of Five Year Results in Two Groups from the Roosevelt Hospital

	1927	1937
Number operated on and followed	107	101
Operative deaths	5	5
Alive and well	53 (36%)	50 (27%)
Number without axillary metastases	50	70
Alive and well	30 (70%)	41 (38%)
Number with axillary metastases	97	116
Alive and well	19 (19%)	14 (12%)
Number with known site of recurrence	88	119
Local recurrence	33 (36%)	46 (39%)
Patients not observed for five years	56	29

Westermarck,⁶ from Radiumhemmet, reported in 1930 on seventy-five patients treated by surgical intervention and postoperative irradiation from 1921 to 1923, inclusive, as well as on forty-five patients who had preoperative as well as postoperative irradiation. He concluded "It will be clear, therefore, that a five years healing result occurs at a higher rate and that the recurrences are less frequent after a combined surgical and radiologic treatment than after surgical treatment only." Anschutz and Siemens⁷ in 1933 reported on 292 patients with Steinthal group II cancer. They found that the five year period of freedom from known recurrence had increased 19.6 per cent with the addition of postoperative irradiation.

Hermet⁸ of the Curie Institute in Paris concluded in a recent article (1936) "We are obliged to state that the question of radiotherapy in cancer of the breast is still long distant from having reached the state comparable to that of radiotherapy of other neoplastic localizations. The competition between surgery alone, radiation alone, or their combination remains open. Much work is still necessary before arrival at definite opinions. But we know already that irradiation in a considerable number of cases has increased the prognosis of life."

Allen Graham⁹ of the Cleveland Clinic in 1936 published a most interesting study of cancer of the breast. Essentially all the operations had been performed by Crile, without any essential change in technic, so that an excellent opportunity was afforded to note the effect of the addition of irradiation to surgical treatment. One hundred and seven patients had operation alone, with 31 per cent alive five years or more, 175 had operation and irradiation, with 23 per cent alive five years or more. He concluded "In the series of cases of primary cancer of the breast studied, there was no general indication that the clinical end-results were better in the patients who were treated by operation and irradiation than in those who were treated by operation alone. This was found to be true whether the comparisons were made of the totals for the non-irradiated and irradiated patients for the entire time period, 1895-1930, or for successive five year periods."

I recently made a study of 191 patients from the Roosevelt Hospital who had been observed for five years or more and who had received postoperative irradiation. I was able to compare the results with those in a series of 157 different patients, on whom I reported in 1927,¹⁰ on whom postoperative irradiation was not used.

Even allowing for factors of statistical error, it is apparent that the postoperative irradiation employed up to 1931 did not increase the expectancy of five year freedom from disease.

The determination of operability is a factor that varies with the clinic and the surgeon. It will cause a variation in the percentage of recurrence in the operative field. At Johns Hopkins Hospital,¹¹ the home of the Halsted operation, in seventy-nine of 225 cases, or 35 per cent, local recurrence developed. In 36 per cent of the 1927 cases at the Roosevelt Hospital in which surgical treatment alone was used, local recurrence developed, while in 39 per cent of the 1937 group, in spite of postoperative roentgen therapy, local recurrence developed. This is a direct challenge to roentgen therapy, for this is one place where it should be effective. It is also a reflection on the type of therapy in vogue up to 1931. These recurrences were not all due to inefficient radical operation, as some undoubtedly were retrogressive outcroppings from mediastinal and chest metastases. It is also to be noted that coincident with the local recurrences metastases elsewhere were frequently observed.

As have the methods of treatment seen in all departments of roentgen therapy during the past five years, the methods at the Roosevelt Hospital of administering radiation have changed. At the present time my associates and I attempt to give the patient 2,000 roentgens in four or five portals to include the breast area, mediastinum, supraclavicular area and upper part of the chest, axilla with both anterior posterior (Coolidge tube in front) and posterior anterior (Coolidge tube from dorsum) covering these areas. The treatments are delivered during a period of from twenty to thirty days. With this method we have gained the impression that the percentage of local recurrence is being reduced, but it is too soon to form a definite opinion.

TABLE 2—First Sites of Recurrence

Local	46
Other breast	7
Supraclavicular	6
Chest	27
Abdomen	14
Osseous system	19
	110

One may readily irradiate the operative field and the supraclavicular nodes, axilla and mediastinum, for it is reasonable to believe that roentgen therapy in effective doses can prevent or control local recurrence. The problem, however, is what other areas should be treated. Only too often one knows that cancer has already gone beyond the operative field and yet has no known method to detect it. It is like a will-o'-the-wisp, now here, now there. May one ask the roentgenologist to treat all the possible fields? In a recent study I observed that the first known site of recurrence in over 69 per cent of the cases was outside the operative field, viz., in the other breast, the supraclavicular nodes, the

6 Westermarck, Nils. Acta radiol. 2: 132, 1930.
7 Anschutz, W. and Siemens, W. Zentralbl. f. Chir. 60: 925, 1930 (April 22), 1933.
8 Hermet, P. Paris med. 1: 233, 242 (March 21), 1936.
9 Graham, Allen. Pennsylvania M. J. 39: 561 (May), 1936.

10 White, W. C. Ann. Surg. 86: 695, 701 (Nov.), 1927.
11 Lewis, Dean and Rienhoff, W. I. Jr. Ann. Surg. 95: 336 (March), 1932.

chest, the abdomen or the osseous system. To what extent is general roentgen therapy feasible? Therapy, to be effective, must be given in large doses to each area treated. It is questionable whether effective doses could be given to all these regions without damage to healthy tissue, particularly the organs of the chest and the abdominal cavity.

In 1899 Schinzinger advocated castration as a method of holding cancer in check. In 1896 Beatson reported favorable results with castration. At the turn of the century this treatment became quite popular, only to lose favor gradually, largely because of the operative mortality associated with it. With the development of irradiation it became apparent that here was an agent that could accomplish the same result without any mortality. Witherspoon¹² well stated the present view when he wrote: "Because the ovarian hormones, especially the estrogenic principle, are growth promoting factors in normal mammary development, and because cancer is essentially an unrestricted growth, it is not illogical to deduce that in pathological conditions of the breast, such as carcinoma, these hormones may stimulate malignant as well as mammary growth." Dresser¹³ and Martin¹⁴ and others first noted the beneficial effect of roentgen castration in metastases to bone. Dresser said: "Many experienced relief of pain and definite retrogression of the secondary lesions evidenced by hyperplastic changes in the rarefied areas originally observed in roentgenograms of the affected bones." In view of these observations, it was but logical to go one step further and advocate roentgen castration in all cases of primary cancer whether favorable or unfavorable. Pregnancy to cancer is like tinder to gunpowder, and this danger is also avoided by castration.

It is proper to observe that this method has not yet been used long enough or widely enough for final judgment. There seems to be no question of its merit in restraining the growth of cancer of the breast for a while, especially in women under 45 years of age. Whether the restraint is long enough in cases of primary cancer to warrant castration, with all its secondary physical and mental effects, is a nice question of judgment and one which only time and experience will answer. This is especially true with regard to small primary tumors without any discoverable metastases.

Interstitial irradiation with radium either as the element or as radon has been used in conjunction with surgical treatment at the time of operation. For years Handley¹⁵ has implanted radon seeds into the parasternal intercostal spaces where the perforating branches of the internal mammary lymph channels come through. He has felt that this procedure is of value, but others have tried it only to abandon it because of apparent lack of results. Also it is not without danger in its application because of possible injury to the internal mammary artery, the pleura or the pericardium.

Keynes¹⁶ is an enthusiastic advocate of interstitial irradiation (1) of the breast and primary growth and (2) the accessible lymphatic areas. Needles of the element are usually introduced with the patient under gas and oxygen anesthesia, kept in for seven days and removed with similar anesthesia. The breast or part of

it may or may not be removed later. Keynes expressed the opinion that his results compare well with those of operation, although as yet there has been no five year report.

In this country, Adair and Qumby⁶ have reported five year results in patients treated entirely by internal and external irradiation.

In forty-seven patients the disease apparently was confined to the breast, yet only 49 per cent survived five years. "In the operable cases involving both the breast and the axilla there was not one five year cure." I have not had sufficient experience with this type of treatment to pass critical judgment. I agree with Adair and Qumby that their results do not justify its use in place of surgery except under special conditions such as heart disease and debilitating constitutional disease.

SUMMARY

1 Radical meticulous operation is definitely indicated for all operable cancers of the breast. It requires a careful following of the teachings of Halsted and Handley.

2 Postoperative radiation therapy should be of advantage in preventing or restraining recurrence in the operative field.

3 Preoperative irradiation treats the lesions in the operative field. It may therefore be of greater help than postoperative therapy in preventing or restraining local recurrence.

4 Postoperative therapy has so far not increased the five year postoperative expectation of freedom from disease.

5 In my opinion the failure before 1931 to show improvement with postoperative irradiation was largely due to the concentration of therapy on the operative field without due regard to the usual spread of the disease beyond the breast into the chest, the intercostal lymph channels, the vertebrae and the other breast. The 30 to 40 per cent failure in the treatment of so called favorable localized tumor of the breast is due to these metastases, not to the lack of thoroughness in radical operation. A method of irradiation must be devised that will reach these areas without causing undue damage to the healthy tissue.

6 Castration by irradiation holds considerable promise of restraining the growth of cancer cells.

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ABSTRACT OF DISCUSSION

DR. FRANK E. ADAIR, New York. The subject of irradiation is far from being settled, one reason being that the therapy, the technic and the instruments of irradiation change so frequently that it is difficult to evaluate procedures properly. If people were better educated on the subject of cancer, so that they came to the surgeon earlier, we would not be talking so much about the comparative values of surgery and irradiation. Dr. White spoke of 117 of my cases in which I gave anything from 1,200 up to 2,400 roentgens per postoperative field. In that group there was a considerable number with lymphedema following operation. The wound did not heal nicely, and there was delayed healing in a number. The group with only the breast involved eventually will be abandoned to surgery only. In our group in which we had given large amounts of preoperative irradiation, we got complete destruction of the breast cancer in about 33 per cent of the cases, but in those cases of cancer of the breast with the axilla involved we got only 22 per cent of axillary destruction. The difficulty with this group is that I could not anticipate in advance

¹² Witherspoon J. T. Roentgen Irradiation of the Ovaries as Supplement to Surgical and Radium Therapy for Mammary Cancer. *Arch Surg* 33: 554-559 (Oct.) 1916.

¹³ Dresser Richard and Dumas C. E. *Am J Roentgenol* 36: 322 (Sept.) 1936.

¹⁴ Martin C. L. *Am J Roentgenol* 36: 314 (Sept.) 1936.

¹⁵ Handley W. Sampson. *Surg Gynec & Obst* 45: 721 (Dec.) 1927.

¹⁶ Keynes Geoffrey. *Brit J Surg* 19: 415-480 (Jan.) 1932.

case the cancer was going to disappear. There was no way of differentiating between the cancer that was going to disappear and the one that was not. The third method of irradiation is that of external irradiation only as the complete therapy. I have not yet heard end results from any clinics in which this is done. Dr. Masson of Belgium is going to report on a number of such cases. The fourth method is that of Geoffrey Keynes, which was reported last week and compared with the accomplishments of surgery alone. In his report Keynes gave 71 per cent five year cures by his multiple radium needle method of needling the breast, axilla and supraclavicular areas. He compared his 71 per cent five year cures with the results of 69 per cent by surgery alone in his own hospital. The fifth method will probably be the most effective method, one which is agreed to by Coutard and also by Pfahler, which is to give a mild dose of preoperative irradiation, then do a radical amputation, and follow that by postoperative irradiation. Dr. White, in his effort to prove that irradiation had not been of value in the Roosevelt series of cases, presented more of a statement than evidence. In his 1927 series he has alive 37 per cent, in the 1930 series there are 27 per cent alive. When both the breast and axilla were involved, he has 19 per cent five year cures in the 1927 series and only 12 per cent in the 1937 series. Also, he reports local recurrence in 39 per cent of his cases. Can these results by any stretch of one's imagination be laid at the door of irradiation? I do not think those figures and those facts have anything to do with irradiation. It seems to me those are facts which he should explain more or less on a surgical basis. Dr. White at least brings up the point and I agree with him that, to date, irradiation of mammary cancer has been overrated and its value probably overvalued.

DR. ERNEST M. DALAND, Boston. Wainwright demonstrated that apparently innocent pectoral muscles often showed invasion by cancer, hence the necessity of removal of both muscles. Greenough reported, in a large series of cases collected by the American College of Surgeons Cancer Committee, that leaving the pectoralis minor muscle reduced the percentage of cures in the series to 8 per cent below the figure when both muscles were removed. Greenough once remarked that whatever the grade or grouping one must not forget that they are all cancers. Except in the occasional case in which a simple removal of the breast is done with no expectation of cure I believe that every operation for cancer of the breast should be as radical an operation as one knows how to do. I agree with Dr. White that careful search should be made by roentgen examination for all possible foci of metastases before any operation is done. No surgery should be done if there is any spread anywhere except into the axilla and even then only if the glands are movable. I am using irradiation as a means of producing an artificial menopause in all breast patients who are still in the childbearing age. I have tried preoperative irradiation followed by radical operation within a few days with no improvement in the results. I have not used preoperative irradiation with a six weeks delay to operation because I am not willing to delay operation that long. If irradiation is to be used, I believe that an amount known actually to destroy cancer cells must be used. Such doses will produce permanent skin changes. If this means saving lives I will disregard the skin changes, but, if not, I hesitate to use irradiation. Postoperative irradiation cannot hope to stop bone, lung or liver metastases already started before the operation. The only possible good is to prevent cells left in the field of operation or above the clavicle from continuing to grow. Dr. White has said that he had a larger percentage of local recurrences in the series in which postoperative irradiation was given than in the series in which none was given. At the Pondville Hospital, which is the Massachusetts State Cancer Hospital, we did fifty radical operations during the years 1927 to 1931. Twenty of these patients died of cancer. None of these patients received postoperative irradiation. In a series of patients operated on at the Massachusetts General Hospital during the years 1927-1928 and 1929 we have made a similar study of 160 cases. Eighty-seven of the patients died of cancer. The location of the recurrence was known in sixty-five instances. Regional recurrence occurred in thirteen, or 20 per cent of those that recurred. At present our policy is to use postoperative treatment in the malignant growths of high grade in which the

axillary nodes are involved. The irradiation is directed to the upper axilla and supraclavicular region and not to the remainder of the operative field.

DR. GEORGE M. DORRANCE, Philadelphia. I have tried to examine my records for the last two years consisting of about 140 cases, and I have not been able to analyze those cases in which the analysis would be of any value. There are too many factors in this story. People are continually bringing records up, and this is true all over the United States today, and it has not been possible to evaluate those records so that they mean anything. I am sure that a lot of these records are of patients that one would not operate on. One does not operate in cases in which the axilla is involved. Why? I have three cases, one of the patients has been living twenty-one years, another sixteen years and the third fourteen years, and they have had roentgen therapy alone. They made me think. The point I want to bring out is that the doctor said we ought to operate in all the breast cases. I believe we should not operate when the axilla is involved. I think the x-rays will give a much longer period with relief. I think they are followed by fewer secondary recurrences, and I am sure those acute cases which are set on fire with surgery would be far better without the surgery. I do surgery for the selective early case without axillary involvement. But I am decidedly against marked radical operative surgery when there is axillary involvement. One can do better with roentgen treatment. With regard to the high dosage, I have gone over my records of older cases and if the records are of any value I would say that, whether it is an acute condition in a patient aged 34 years or an older woman of 65, the lower x-ray dosages of former years give better results than are being obtained today with extremely high dosage very rapidly given. I cannot tell why, but that is what my records show.

CHRONIC CONSTRICTIVE PERICARDITIS

PHYSIOLOGIC AND PATHOLOGIC CONSIDERATIONS

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Chronic constrictive pericarditis is a term applied to the condition which results when fibrous thickening of the pericardium interferes mechanically with the normal movements of the heart and blood. Nineteen patients with an undoubted diagnosis of constrictive pericarditis have been observed by us in the Vanderbilt University Hospital in Nashville and two patients with a similar diagnosis in the Peter Bent Brigham Hospital in Boston. Studies of these patients form the basis of this report.

That the knowledge of constrictive pericarditis has a quite respectable antiquity is demonstrated by the following quotation from Chevers,¹ written in 1842: "The principal cause of dangerous symptoms appears to arise from the occurrence of gradual contraction in the layer of adhesive matter which has been deposited around the heart, compressing its muscular tissue, and embarrassing its systolic and diastolic movements, but more particularly the latter." Among others Cohnheim² and later Volhard³ have contributed to our

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Read before the Section on Pathology and Physiology at the Eighty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1937.

¹ Chevers, Norman. Observations on the Diseases of the Orifice and Valves of the Aorta. Guy's Hosp. Rep. 7: 387, 1842.

² Cohnheim, Julius. Lectures on General Pathology. London: New Sydenham Society, 1889, vol. 1.

³ Volhard and Schmieden. Ueber Erkennung und Behandlung der Umklammerung des Herzens durch schwierige Perikarditis. Klin. Wchn. chr. 25 (Jan. 1) 1923.

understanding of the condition. Nevertheless, it is only recently that the frequency of the disease and its response to surgical treatment have been appreciated. Churchill⁴ in 1929 reported the first successful operation for constrictive pericarditis in America and collected a total of thirty-seven cases throughout the world in which it had been attempted. Since that time pericardiectomy has been performed on twelve patients in the Massachusetts General Hospital, on twenty in the Lakeside Hospital and on twelve in the Vanderbilt Hospital, not to mention other places. Approximately half of the patients on whom pericardiectomy was performed in the three clinics mentioned are considered well, and some of the others are improved.

On the whole, patients with constrictive pericarditis present a recognizable picture. The most common complaints are dyspnea on exertion, swelling of the abdomen, weakness, cough, edema of the feet and ankles and discomfort in the upper part of the abdomen. Dyspnea on exertion is a frequent complaint, while dyspnea at rest is relatively infrequent. On examination, the impressive signs are those of systemic congestion, namely, prominent veins, elevated venous pressure, enlarged liver, ascites and peripheral edema. Pulmonary edema is rare, while pleural effusion is frequently encountered. Unlike most conditions caused by heart failure, these signs may remain unchanged for months or years. They point strongly to failure of the right side of the heart and are combined with a normal or only slightly increased area of cardiac dullness, a fixed heart with diminished pulsations, distant heart sounds and an absence of visible or palpable apex beat. There are usually tachycardia and regular rhythm without murmurs. The pulse is usually paradoxical and the pulse pressure is small. The combination of a marked degree of peripheral congestion with a small quiet heart is the most weighty point in the recognition of the condition. The peripheral signs suggest heart failure, but the heart itself does not supply the basis for such failure. Ascites appears before other accumulations of fluid in some patients, and there may be an erroneous diagnosis of cirrhosis of the liver or of tuberculous peritonitis.

In an attempt to define the alterations in the circulation, the following phenomena have been studied: the pressure in the veins, the pressure in the arteries, the heart rate, the movements of the heart, the velocity of the blood flow, the total blood volume and the output of the heart. The signs have many similarities to those encountered in heart failure, but there are certain striking differences, which will be pointed out. In general, the following data have been obtained:

I The pressure in the veins

- 1 The pressure is high (from 150 to 390 mm of water in systemic veins as compared with a normal of 50 to 100).
- 2 This elevation is persistent. It may fluctuate, but it does not return to normal and it may be high for years.
- 3 The pressures in arm and leg are not notably different unless there is considerable ascites, an observation which implies that the obstruction is in the heart and not in a cava.
- 4 The pressure rises with exercise more than it does in a normal subject.
- 5 The pressure rises with the intravenous infusion of saline solution at a rate which causes no rise in a normal person.

(These data are similar to those for patients with heart failure with the exception that the elevation of venous pressure

is more persistent when it is due to constrictive pericarditis than when it is due to alterations in myocardial function.)

II The pressure in the arteries

- 1 The systolic pressure is usually between 90 and 110 mm of mercury.
- 2 The pulse pressure is usually between 15 and 25 mm of mercury. The pulse is small.
- 3 During inspiration the arterial pressure falls and the pulse becomes palpably smaller, i.e., pulsus paradoxus is present.

(These changes in arterial pressure are not usually associated with myocardial failure.)

III The heart rate

- 1 The heart rate is more rapid than in normal person. Under basal conditions the heart rate if normal is $\pm 58-66$, the rate of these patients is 80-106.
- 2 There is an excessive rise with exercise.

IV The movements of the heart

Fluoroscope and the x-ray kymograph show a diminution of the excursion of the ventricles, usually more marked on the right.

V The total blood volume

The total blood volume was determined in two cases by means of a blue azo dye (the method of Gregersen, Gibson and Stead⁵). The total blood volume was increased in both cases to from 30 to 45 per cent above that found in normal subjects. (This change is comparable to the alteration observed in patients with severe congestive heart failure.)

VI The velocity of the blood flow

This function (as indicated by arm to tongue or arm to carotid time) is diminished. The time is therefore prolonged, in some cases to forty or even sixty seconds, as compared with a normal time of from sixteen to twenty-one seconds. (This prolongation is similar to that observed in congestive heart failure.)

VII The output of the heart

- 1 The output of the heart per minute was definitely diminished in four out of five cases studied. As compared with a normal of ± 3.87 liters, it was usually in the neighborhood of 2 liters.
- 2 The output of the heart per beat was diminished in all cases, it was from 18 to 40 cc, as compared to a normal average, according to Grollman, of 64 cc.
- 3 This output per beat is relatively fixed, i.e., during exercise it increases little, probably in most patients not at all.

Of these changes the high venous pressure and the reduced cardiac output appear to be the most important dynamic consequences of constrictive pericarditis. The effects of these may now be considered. As will be pointed out later, it should not be stated dogmatically that certain changes are due exclusively to the high venous pressure and that others are due entirely to the diminution in the output of the heart. However, the effects of the high venous pressure and the diminished cardiac output may be divided grossly into the two following groups:

- I Effects of high venous pressure and venous congestion
 - 1 Venous distention, which is visible not only in the surface veins but also in those of the retina.
 - 2 Engorgement of the liver.
 - 3 Tachycardia.
 - 4 Increased respiration.

⁴ Churchill, E. D. Decortication of the Heart (Delorme) for Adhesive Pericarditis. *Arch. Surg.* 19: 1457 (Dec.) 1929.

⁵ Gregersen, M. I., Gibson, J. J. and Stead, E. A. Physiological Determination with Dyes of Errors in Colorimetric Use of the I. T. 1824. *Am. J. Physiol. Proc.* 113: 54 (Sept.) 1935. (pub. 7/1/35) and Evans, W. A. Jr. Clinical Studies of the Blood Volume. *J. Clin. Investigation* 14: 301-317 (May) 1935. (Nov.) 1935.

- 5 Elevation of the spinal fluid pressure In our cases this was higher than the venous pressure, and it may reach 400 mm of water The patient who had this high pressure (for only a short period) had no papilledema
 - 6 Elevation of the lymphatic pressure We have demonstrated this in experimental constrictive pericarditis⁶
 - 7 Edema, ascites and pleural effusions, which are in the main the result of increased venous pressure There is no evidence in the analysis of the edema fluid, which is poor in protein, that the permeability of the capillary wall is increased, nor is the osmotic pressure of the plasma low
 - 8 Epistaxis Several of our patients had frequent nose-bleeds
- II Effects of diminished cardiac output and of inability to increase it to a normal extent
- 1 Tachycardia, which is to some degree compensatory
 - 2 Low blood pressure
 - 3 Low pulse pressure and small pulse
 - 4 Paradoxical pulse, due partly to the effect of the reduced output per beat (which makes it more obvious) and partly, according to Katz and Gauchat⁷ directly to the scar in keeping from the heart the normal effects of changes in intrathoracic pressure
 - 5 Weakness and cyanosis When the output is greatly reduced the patient may feel weak and even exhibit cyanosis and coldness of the extremities, all for an obvious reason (i e, reduced flow through the periphery)
 - 6 Lowered tolerance to exercise This is the most important result of the disturbance of output The limitation to systolic output deprives the body of one of the methods of increasing the output of the heart per minute There remains only the method of increasing the pulse rate This method has rather narrow limits, especially since the pulse is elevated even at rest Therefore, even mild exercise usually drives the body to an increased removal of oxygen from the blood, and patients who are comfortable at rest may have severe dyspnea with slight exertion

The manifestations of constrictive pericarditis thus include changes in venous pressure which are similar to those in congestive heart failure and changes in cardiac output and arterial pressure which are somewhat similar to those observed in patients with circulatory collapse Successful operation is followed by changes in the measurements of the circulatory functions toward the normal These changes indicate that the primary mechanical disturbance is relieved by the surgical procedure employed The procedure which appears to be common to successful operations is the removal of a considerable area of thickened tight pericardium from the ventricles This suggests that these patients suffer from an inability of the ventricle to dilate adequately The limit to the dilatation of the ventricle established by the constricting pericardial scar impedes the entrance of the blood into the heart This obstruction reduces the amount of blood entering the heart and leads to the accumulation of the blood in the venous system and to a high venous pressure While it appears that this inability of the heart to dilate during diastole is responsible for most of the signs and symptoms in constrictive pericarditis, it seems doubtful in many instances that the heart could expel the normal quantity of blood at each contraction, even if it could receive it The inextensible and relatively unyielding scar which is

attached to the entire surface of the heart must offer a real impediment to systolic contraction Shortening and rotation of the heart in systole are almost entirely abolished

Similar changes in the circulation may be brought about by certain acute conditions, especially those which lead to the accumulation of fluid in the pericardial cavity Probably the most rapid in onset of these is the hemopericardium, which may follow a wound or rupture of the heart and produce so-called tamponade of the heart When this occurs the superficial veins become more prominent than normal but not to the marked degree that is observed in more chronic obstruction The systolic pressure declines, the pulse pressure is small, the pulse may be paradoxical and tachycardia is usually present Because of the short duration of the disorder, the pericardium increases only slightly in size, and hence the size of the cardiac-pericardial area appears but little increased on physical and x-ray examination It is doubtful that a rapid intrapericardial hemorrhage of more than 400 cc is compatible with life for more than an hour or so A considerable portion of the space occupied by such blood is space originally filled by the heart, and the accumulation of fluid does not represent entirely an increase in the capacity of the pericardium As pointed out by Bigger,⁸ fluoroscopic examination reveals a diminution or absence of visible pulsations of the heart The inability to elevate the arterial blood pressure appreciably by increasing the blood volume by way of the veins is illustrated by our experience in a case of hemopericardium of approximately one hour's duration The systolic blood pressure was 70 mm of mercury, and it remained at this level despite the fact that one liter of salt solution and 600 cc of blood were introduced intravenously After the release of the tamponade and the closure of a wound in the left ventricle, the pressure rose immediately

The formation of sterile or infected pericardial effusions may be moderately rapid or slow, and the signs and symptoms are dependent somewhat on the time factor Usually such effusions form rather slowly, and the manifestations are somewhat different from those observed in hemopericardium With the passing of time the veins and the pericardium stretch, and hence prominent veins and an enlarged shadow are found on x-ray examination The liver increases in size, and free fluid may accumulate in the pleural and peritoneal cavities Edema of the extremities may appear The alterations in the heart and pericardium in these various disorders are pictured graphically in figure 1

Tricuspid stenosis is another disorder in which an impediment to the entry of blood into the heart is to be expected, and recent work by Blumgart and Altschule⁹ has shown that many of the circulatory phenomena seen in constrictive pericarditis are to be observed also in tricuspid stenosis Thus in patients with tricuspid stenosis an elevation of the venous pressure (and the effects of an elevated venous pressure) may remain for a long period High venous pressure due not to myocardial inefficiency but to such mechanical obstruction will not be restored to normal by digitalis and rest However, some patients exhibit tricuspid obstruction

⁶ Blalock Alfred and Burwell C S Thoracic Duct Lymph Pressure in Concretio Cordis An Experimental Study J Lab & Clin Med 21: 296 (Dec) 1935

⁷ Katz L N and Gauchat H W Observations on Pulsus Paradoxus (With Special Reference to Pericardial Effusion), Arch Int Med 33: 371 (March) 1924

⁸ Bigger I A Wounds of the Heart and Pericardium South M J 25: 785 (Aug) 1932

⁹ Blumgart H L, and Altschule M D The Circulatory Dynamics in Tricuspid Stenosis Their Significance in the Pathogenesis of Edema and Orthopnea Am Heart J to be published

and myocardial failure simultaneously, and in these patients treatment of the myocardial failure by the usual methods may result in a reduction of venous pressure, although the pressure will not return to the normal level. Tricuspid stenosis and most of the lesions of the pericardium which lead to "inflow stasis" interfere chiefly with the entrance of blood into the right ventricle. There appears no reason to doubt that mitral stenosis—a more frequently encountered valvular lesion—operates in a similar way to interfere with the entrance of blood into the left ventricle.

This concept with regard to mitral stenosis is perhaps of importance. It suggests that congestion and an elevated venous pressure may develop in the absence of true myocardial failure in the lungs of patients with an obstruction of the mitral valve. This theoretical

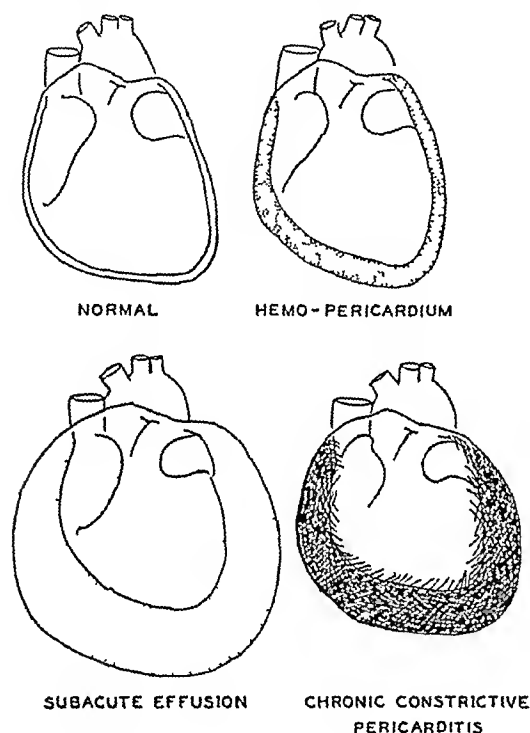


Fig. 1.—Normal heart and pericardium, hemopericardium with the heart slightly smaller and the pericardial sac slightly larger than normal, subacute effusion with the heart slightly smaller and the pericardial sac considerably larger than normal and chronic constrictive pericarditis with the heart smaller than normal, the pericardial cavity obliterated and marked thickening of the pericardium and epicardium present.

consideration is in agreement with certain observations on patients, e. g., that pulmonary congestion associated with mitral stenosis may carry a less grave prognosis than the same condition associated with aortic disease or hypertension. The reason doubtless is that in the one case it may be due to mechanical obstruction, which may remain stationary for a considerable period, and in the other it is due to failure of the left ventricle—a condition which tends to progress.

Obviously such physiologic considerations as are presented in this paper may have a bearing on the problems of treatment in patients with "inflow stasis." Patients with severe constrictive pericarditis commonly show a marked increase in venous pressure and a marked decrease in the cardiac output. The elevation of the venous pressure and the decrease in cardiac output do not, however, bear a simple relationship to one another, because the elevation of the venous pressure presumably increases the diastolic filling of the

heart and thus tends to maintain or elevate the cardiac output per beat. Conversely, there is some evidence that lowering of the venous pressure (e. g., by diuresis or phlebotomy) may reduce the cardiac output. In one of our patients exercise was associated both with a rise in venous pressure and with an increase in the output per beat. In this connection there is some evidence that the high venous pressure may be more important than the low cardiac output in producing disability, e. g., the striking improvement of one of the patients following pericardiectomy has been associated with a marked fall in the venous pressure but with relatively little change in the output of the heart at rest. In other words, this patient can now maintain a cardiac output of 25 liters per minute with an essentially normal venous pressure and an essentially normal cardiac rate. Before operation she could maintain such a cardiac output only at the price of tachycardia and elevated venous pressure.

An interesting and unanswered problem in connection with patients with constrictive pericarditis concerns the question of whether they should be digitalized, particularly when operation is contemplated. Harrison and Leonard¹⁰ showed that digitalis decreases the output of the heart in normal dogs. Burwell, Neighbors and Regen¹¹ found that it decreases the cardiac output in normal man. When digitalis is given to patients with constrictive pericarditis the improvement is certainly not striking. Indeed, Burwell and Strayhorn¹ have studied a patient with constrictive pericarditis in this connection and observed that digitalis further decreased the already low output per minute. This effect was due chiefly to a decrease in the basal pulse rate, and there was little alteration in the output per beat. It is obvious that when the output per beat is fixed an increased heart rate is the only available way of increasing the amount of blood pumped per minute. Reduction of this rate may under certain circumstances be an unfavorable influence. In spite of this evidence it is possible that administration of digitalis may be advisable as a preoperative measure. An underworked heart, which may be atrophied and then suddenly exposed to a demand for increased work, might be usefully supported by digitalis. That such treatment is not always effective is shown by the fact that in one of Churchill's patients, thoroughly digitalized, acute dilatation of the ventricle developed shortly after operation.¹²

As a result of experimental observations on the effects of the exposure of the heart to atmospheric pressure, Beck¹⁴ has recommended the use of the Sauerbruch negative pressure chamber during the performance of a pericardiectomy. One of us¹⁵ had been unable under slightly different experimental conditions to confirm entirely his results. Churchill¹⁶ expressed the opinion that the atmospheric pressure may be a helpful rather than a harmful agency shortly after decortication, in that it may prevent excessive dilata-

10. Harrison T. R. and Leonard B. W. The Effect of Digitalis on the Cardiac Output of Dogs and Its Bearing on the Action of the D in Heart Disease. *J. Clin. Investigation* 2: 1 (Oct.) 1936.

11. Burwell C. S., Neighbor DeWitt and Regen E. M. The Effect of Digitalis upon the Output of the Heart of Normal Man. *Circulation* 5: 125 (Dec.) 1927.

12. Burwell C. S. and Strayhorn W. D. Constrictive Pericarditis. A Clinical Study with Observations on the Venous Pressure and Cardiac Output. *Arch. Surg.* 24: 106 (Jan.) 1932.

13. Churchill E. D. Personal communication to the author 1934.

14. Beck C. S. and Isaac I. Lechelle. Pneumocardiac Tamponade. A Study of the Effects of Atmospheric Pressure Negative Pressure and Positive Pressure upon the Heart. *J. Thoracic Surg.* 1: 124 (Dec.) 1931.

15. Blalock Alfred. Exposure of the Heart to Atmospheric Pressure. Effects on the Cardiac Output and Blood Pressure. *Arch. Surg.* 28: 66 (March) 1933.

16. Churchill E. D. Pericardial Resection in Chronic Constrictive Pericarditis. *Ann. Surg.* 104: 516 (Oct.) 1936.

tion of the weakened muscle. He has considered the advisability of artificially supporting the ventricle or of bleeding the patient as a means to prevent over-dilatation.

In a consideration of the relationship of the pathologic lesion to physiology, the question as to the portion of the scar which it is most important to remove is of interest. We have made no attempt to remove the scar tissue from about the vena cava, and improvement has resulted in most of our cases. A photograph of an autopsy specimen which is reproduced in figure 2 shows the tuberculous process surrounding the large vessels at the base of the heart and gives an idea as to the difficulty that would be encountered in attempting to remove it. Churchill¹⁴ stressed the importance of freeing the right auriculoventricular groove and stated that there is usually little scar between that point and the vena cava. He did not attempt to remove this. The fact that the pressures in the veins of the arms and the legs are practically identical in most instances is some evidence against the view that the obstruction might be mainly in the great veins for it would be expected that one would be involved more than the other in some instances. These observations seem to indicate that there is really a limitation of the ability of the heart to dilate rather than an obstruction about the great veins.

Schmieden¹⁷ stated that the left ventricle is the part of the heart which it is most important to decorticate. We question seriously the correctness of this view. Most of the signs and symptoms are attributable to back pressure from the right side of the heart and it would seem that it is most important to decorticate the right ventricle. In our experience major emphasis has been placed on removing the scar from the right ventricle. At any rate the right and left ventricles should be decorticated as thoroughly as seems feasible and it is quite dangerous and probably unnecessary to attempt to remove the scar from the auricles. It has been stated by Schmieden,¹ Cutler and Beck¹⁸ and others that it is important to free the left ventricle from its scar before decorticating the right. The reason given is that liberation of the weak right ventricle before the left may result in an over-dilatation of the muscle and valvular insufficiency. This would seem to be possible from a theoretical point of view or acute pulmonary edema might be expected, but we have seen no harmful effects in cases in which the right ventricle was decorticated first.

The coronary vessels may become intimately attached to the scar. This may play some part in the production of atrophy of the heart muscle, which is frequently observed. The atrophy is probably due also to partial disuse. It is certainly of importance from a surgical point of view, for a coronary artery may be included with the scar tissue that is removed unless great caution is exercised. A photomicrograph of an autopsy specimen showing heart muscle scar and a coronary artery is reproduced in figure 3.

The etiologic agent which is responsible for the pericarditis may, in some instances, invade the myocardium. While an extension of a tuberculous process from the pericardium to the myocardium which is in immediate proximity to it, is often encountered,

isolated myocardial tuberculosis is a rare observation. Gouley, Bellet and McMillan¹⁹ reported six instances of tuberculosis of the myocardium and found descriptions of approximately 200 cases which had appeared in the literature. In five of their six cases the involvement of the coronary vessels was limited to the smaller ones. In the sixth case, however, the tuberculous involvement included the largest divisions of the coronary arteries. They stated "The coronary vessels could be followed for only a short distance beyond their point of origin being involved in and destroyed by the diffuse infiltration. No remnant of the main posterior descending artery or vein could be found and the remaining portion of the left anterior descending artery could be followed for only a short distance from its point of origin. The portion of the vessel that was



Fig 2—The heart and portions of both lungs. The caseous tuberculous process surrounds the great vessels at the base of the heart. It extends directly into the mediastinum and into the right lung.

recognized showed a very narrow lumen and was flattened and compressed by the extensive surrounding tuberculous process."

Constrictive pericarditis may result from various infectious processes. White²⁰ made the following statement concerning the etiology of the fifteen cases of constrictive pericarditis which he and Churchill observed and treated. The etiology of the chronic pericardial disease can be assigned as follows: tuberculous in two (questionable in two others), pneumonia with polyserositis (including both pleuritis and pericarditis) in two, sepsis in one, rheumatism in none, uncertain or unknown in ten (in five of which however there was a definite history of acute peri-

¹⁷ Schmieden, Victor. The Technique of Cardiolytic Surg. Gynec. & Obst. 43: 89 (July) 1926.

¹⁸ Cutler, E. C. and Beck, C. S. Surgery of the Heart and Pericardium. In Nelson's 100 Chief Living Surgery. New York: Thomas Nelson & Sons, 1927, vol. 4, p. 23.

¹⁹ Gouley, B. A., Bellet, Samuel and McMillan, T. M. Tuberculosis of the Myocardium. Report of Six Cases with Observations on Involvement of Coronary Arteries. Arch. Int. Med. 51: 244 (Feb.) 1913.

²⁰ White, P. D. Chronic Constrictive Pericarditis (Fick Disease) Treated by Pericardial Resection. Lancet 2: 539 (Sept. 7) 1925.

carditis)" In sixteen of our nineteen patients in the Vanderbilt Hospital the disease was almost certainly tuberculous in origin. Active tuberculous infection of the pericardium was demonstrated in eleven by the presence of characteristic tubercles in microscopic sections. It was not accompanied by significant amounts of fluid. The etiologic agent in two patients was *Staphylococcus aureus* and in the remaining patient the disease probably began with a pyogenic infection. Acute rheumatic fever was not the initiating agent in any of these patients. Our experience and that of White²⁰ raise the question as to whether rheumatic fever ever results in chronic compression of the heart. He stated: "It is of further interest that a series of 1,000 children with the rheumatic infection studied at the House of the Good Samaritan in Boston, and followed over a period of ten years has shown in not a single instance any evidence of chronic constrictive peri-

carditis. In rheumatic infection, on the other hand there is a sticky exudate of a fibrinous character which usually, in a relatively short period causes the two layers of the pericardium to become adherent. The acute injury is present, but there is not the long-continued insult as occurs in tuberculous infection. The scar which is formed is not as thick and is more yielding. Pneumococcal and streptococcal infections also are not apt to produce dense, thick inelastic scar tissue as infections with the tubercle bacillus and the staphylococcus. We have now under observation a patient who is known to have had acute suppurative pericarditis due to pneumococci. The pericardial cavity was drained two months ago. There has been a reduction in the size of the cardiac-pericardial shadow, but at present there is evidence of increasing obstruction to the entry of blood into the heart, which suggests that constrictive pericarditis may be developing.



Fig. 5.—Section ($\times 10$) showing the heart muscle and the thickened pericardium and epicardium. The coronary artery is intimately attached to the scar.

carditis, even though the heart was often seriously involved in other respects and even though acute pericarditis had been noted in many cases during their acute rheumatic infection."

As stated, a tuberculous infection was responsible for the constrictive pericarditis in most of our patients, and in infection with *Staphylococcus aureus* ranked second. The tubercle bacillus and the staphylococcus particularly the former, would be expected to produce the disease most often as they cause a chronic proliferative type of disease. There is a deposition of granulation tissue which is converted into a dense inelastic scar. MacCallum²¹ stated: "If very thick dense layers of fibrous tissue are formed—if the adhesions are firm or tunneled with channels filled with yellowish opaque fluid, or if, with the thickening of the sac and epicardium, a hemorrhagic fibrinous and fluid exudate accumulates, the tuberculous nature of the affection may be suspected, and close inspection will usually show little nodular tubercles in the granulation tissue."

The mortality rate for patients with tuberculous pericarditis is quite high, particularly if the disappearance of fluid is followed by an active proliferative process. For this reason it is our impression that pericardiectomy should not be too long delayed. It is often successful when tuberculous activity is present in the pericardial scar. When a tuberculous pericardial effusion disappears but the evidences of obstruction continue and the patient's condition becomes worse, operation should be considered.

SUMMARY

There is a disorder of the circulation which is characterized by striking and long-standing venous engorgement, by enlargement of the liver, by ascites, by weakness and sometimes by edema. The signs and symptoms are in the main dependent on the movement of the heart and blood. These alterations in the circulation include (1) elevation in the systemic venous pressure, (2) a low systolic arterial pressure and a small pulse pressure, (3) tachycardia at rest, (4) diminution in the pulsations of the heart, (5) a decrease in the velocity of the blood stream, (6) an increase in

²¹ MacCallum, W. G. A Text Book of Pathology. Philadelphia: W. B. Saunders Company, 1922, p. 223.

the total blood volume and (7) a decrease in the output of the heart. The normal pericardium is replaced by a thick and inextensible capsule of fibrous tissue. Such chronic constrictive pericarditis may result from acute pericarditis due to a variety of causes, but the tubercle bacillus is the most frequent etiologic agent. Treatment by removal of a sufficient portion of the thickened pericardium results in a gratifying number of cases in a relief of the symptoms and a return to health.

THE ORIGIN OF HEART SOUNDS AND THEIR VARIATIONS IN MYOCARDIAL DISEASE

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During every generation since Rouanet advanced the theory that all heart sounds are purely valvular, a few outstanding cardiac specialists have supported that view.¹ Many physiologists and most writers of medical textbooks have accepted the compromise that the first sound and the gallop sounds are partly muscular in origin, and not a few men distinguish the muscular from the valvular element in describing their auscultatory observations. An attempt to distinguish the muscular and valvular elements in experiments on dogs ended in demonstrating that the first sound was purely valvular,² since vigorous contractions occurred with no audible vibration when venous filling was cut off or the auriculoventricular groove compressed with a ligature which closed off the arterial outlets as well.

A study of our records of human heart sounds and those reported by Lewis,³ Wolferth and Margolies,⁴ and Houssay⁵ has strengthened the conviction that the three normal heart sounds, both diastolic gallop sounds, the mitral snap and the auricular sound as recorded from the esophagus⁶ are due to sudden tensing of valve leaflets. The rubbery mass of heart muscle, which from a physical standpoint seems an ideal sound-rendering substance, apparently gives off no audible vibrations. Its contraction, or filling, or even its forceful impact against the chest wall contributes nothing to the heart sounds. The fact that audible vibrations can be obtained from thin strips of muscle isolated from the ventricle is of no significance, for it is easy to produce sounds with a thin rubber band but almost impossible with a rubber ball as thick walled as the heart.

Unlike murmurs, the heart sounds mentioned are very brief and sharp (fig 1). While it is true that the first and second sounds are sometimes muffled, or impure and prolonged, this has been shown to be due to the slightly asynchronous occurrence of the sharp sounds produced in each half of the heart, and when these sounds are actually split or reduplicated the element from either side is short and sharp. Both in Wolferth's⁷ laboratory and in Houssay's⁸ it has been possible, by recording subclavian or jugular pulse waves with the sounds, to identify the first element of an impure or split sound as originating in the right or the left side. Nowhere has it been found that the sound from one half of the heart is ever complex or prolonged. Two of the sounds previously enumerated are ascribed by every one to tensing of the valve fibers when blood presses sharply against unyielding leaflets. At the time the second sound occurs and again when a snap is produced just after the second sound in some cases of mitral stenosis, no chamber is contracting or being filled, so that these sounds can be regarded only as purely valvular⁹ (figs 2 and 3). There is very little difference in pressure on the two sides of the

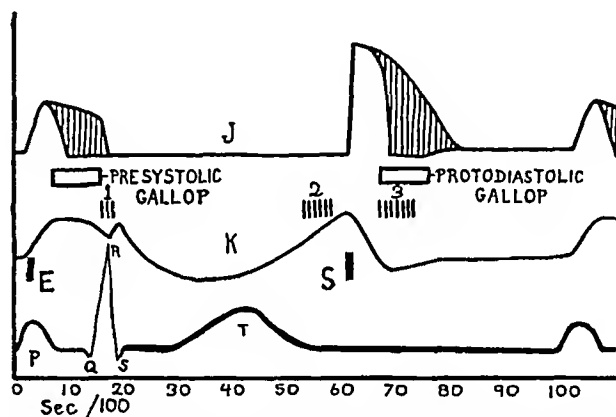


Fig 1.—The position of the sounds in relation to the electrocardiogram, intra-auricular pressure (A) and flow into the ventricles (J). S indicates the mitral snap. E the auricular sound on esophageal auscultation. The variation in ventricular filling is indicated by the shaded areas.

semilunar valves when the second sound occurs and a pressure of only 20 or 30 cm. of water on the mitral leaflets when they snap, yet these valvular sounds may be as intense as the first sound. Thus, only a small force is needed to evoke a loud sound even from leaflets somewhat thickened by disease.

The third sound, the gallop sounds in diastole and the presystolic vibrations, which in many normal persons blend into the first sound, all occur at times when a wave of rapid ventricular filling is coming to a close. The presystolic gallop and the normal presystolic vibrations occur only after auricular systole, never when the auricles fibrillate. The third sound occurs with no dilatation of the heart, even with gallop there never is a dilatation approaching that produced by cardiac standstill, and there is no basis for ascribing such sounds to forcible stretching of the ventricle.

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Read before the Section on Pathology and Physiology at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1937.

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9. Margolies Alexander and Wolferth C. C. The Opening Snap in Mitral Stenosis. Am. Heart J. 7: 443 (April) 1932.

On the other hand graphic records of the apex impulse (fig 4) in cases in which there is a third sound or a gallop usually show a sharp retraction of the apex at the instant the sound occurs¹⁰ so that there is good reason to believe that the wall of the ventricle and the blood within it move suddenly toward the atrioventricular valves at that moment. This can be

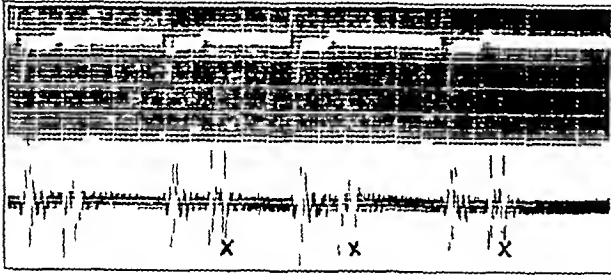


Fig 2—The sound following the second sound was an opening mitral snap; the diastolic murmur was inaudible except at the apex. This sound was recorded medial to and above the apex.

explained as the reflection of the wave of rushing blood when pressure between the auricle and the ventricle becomes equalized or as shown in the diagrams of figure 5 the ventricle rounds out as the jet of blood ceases and the valves are closed and drawn taut by the blood which whirls back against them. Here again sounds which appear to be purely valvular occur with very little force and no muscular contraction or with merely the dying out of auricular contraction. The sound which occurs with the onset of auricular contraction is audible or recordable only from the esophagus just at the level of the auricles¹¹ and the valves of Vieussens and Thebesius which guard the mouths of the coronary veins, are within 1 or 2 cm. of this point. It seems probable that the sound arises when these valve leaflets are drawn tense by the wave of back pressure from the auricular systole.

The first sound which in either side of the heart is a single brief volley of vibrations not unlike a third sound or a gallop sound occurs at the instant when rising ventricular pressure draws tense the atrioventricular leaflets. Although the final rise of pressure is great that developed at the time the sound occurs is much less. The reversal of direction of flow and the

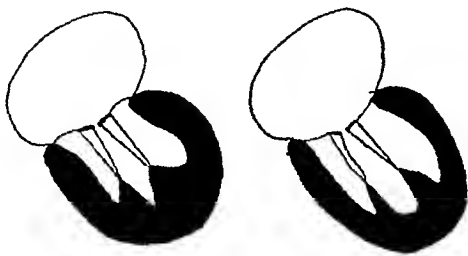


Fig 3—A diagram illustrating the supposed valvular motion in cases of mitral snap. Left: the heart at the end of systole; right: at the moment the sound occurs in early diastole. The dotted line indicates the systolic position of the valve.

sudden thrust against the valve are entirely analogous with those which occur with the sounds just discussed. Certainly a valvular sound is to be expected at that point in the cycle and the sound produced is not

remarkably loud in comparison with the sounds evoked with so little force during diastole. As only one sharp snap is produced on each side there is no need to ascribe the first sound to a fusion of some other vibrations with the valvular sound. The burden of proof is therefore great on persons who infer a muscular element especially since in man, as in the dog, it may occur without production of any sound. This happens when systole occurs before the valves have opened as is seen in the case of an early premature beat (fig 6).

Variations in the intensity of the first sound occur under many conditions, but there is one fundamental basis for these variations. If systole occurs at an instant when inflow from the auricle is pushing the valves toward the apex and separating the leaflets as much as possible, then the sound will be very loud

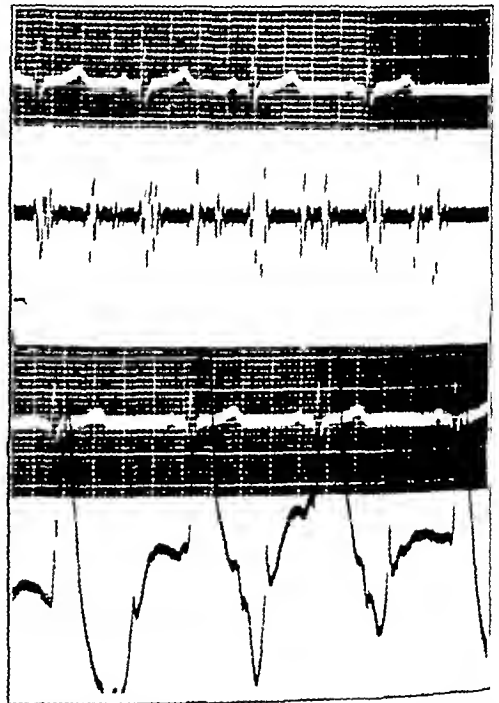


Fig 4—The electrocardiograms and the sound record (above) a 12 apex impulse (below) showing that the third sound and the retraction of the apex follow the second sound at the same interval as that each is more marked when the diastole is prolonged as a result of respiratory reflexes.

It will be loud even if the beat itself is so weak as to cause no pulse wave or second sound. It will be loud even if the heart muscle is failing (fig 7) or if severe bundle branch block has caused a great delay in the activation of the muscle (fig 8).

Early in diastole a ventricular beat causes a loud sound if the sound occurs from 0.10 to 0.20 of a second after the second sound, late in diastole if it occurs from 0.04 to 0.18 of a second after the onset of auricular activation. Sounds occurring in the first 0.04 of a second are usually weaker and those which occur 0.06 of a second or more after the optimal time are often very faint even when the stroke volume is great, arterial pressure high and the ventricle normally activated. This relationship which has been carefully studied by Wolfert and Margolis¹ in patent heart block and in the general run of people is also in auricular fibrillation and ventricular tachycardia and accounts for the great variation in the intensity

¹⁰ Lewis, T. K. Nature and Significance of Heart Sounds and of Apex Impulses in Bundle Branch Block. Arch. Int. Med. 53: 741 (May) 1911.
¹¹ Taquini, A. C. Exploracion del coazon por via esofagica. Ateneo. Buenos Aires, 1911.

of the first sound of successive beats when the heart is irregular and the rate over 140. As shown in figure 6, it also exists in ectopic beats. This applies to basal conditions and hearts with normal atrioventricular valves, if the mitral valve is stenotic¹ or if exercise, fever or anemia cause a great increase in the blood flow, the interval in which accentuation occurs is prolonged. These conditions are of course, the ones which prolong auricular discharge of blood into the ventricle so that the relation of accentuation to the pushing down and separating of the leaflets is again quite clear. When rapid inflow ceases the valves swing up and meet¹² and for an instant may be drawn tense even with force enough to cause a sound. When systole sets in before the valves have swung together the tensing of the valves is more sudden and occurs later than when the valves already are in apposition and there is little or no slack in the fibers. In the former case blood will be in motion toward the valves and pressure will rise while the valves are moving, in

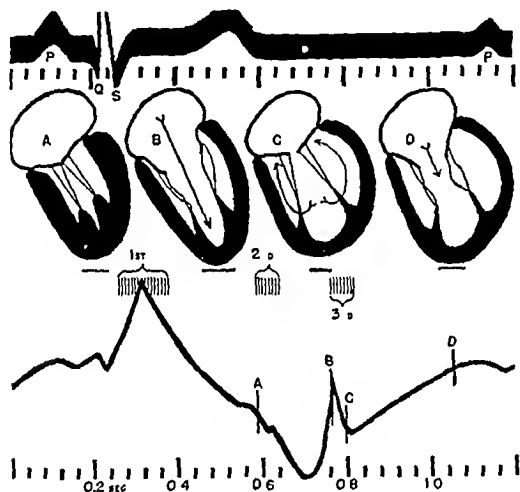


Fig. 5—A diagram based on figure 4 and diagrams showing hypothetical events in the heart at the instants marked A, B, C and D on the cardiographic tracing below. The position of the chest wall is indicated by the line below the apex. The medial movement of the basal third of the ventricle in early diastole in a normal person was recorded by the roentgen cinematograph (Chamberlain W. E. and Dock William. Study of Heart Action with Roentgen Cinematograph. Radiology 7: 185 [Sept.] 1926).

the latter scarcely any blood will move and the pressure will scarcely have begun to rise when the fibers are drawn tense.

Thus there is a reasonable explanation on a purely valvular basis, for the common variations in intensity of the first heart sound. In cases of block in which there are long PR intervals variations also occur which seem to be due to respiration or some other factor which alters the rate of ventricular filling at the moment and in some cases of tachycardia the relation ship to length of diastole is inconsistent. But the great majority of variations in sound intensity can be shown to depend on the position of the atriculoventricular valves at the moment before the sound occurs. Probably when the atriculoventricular interval is constant and a little longer than optimum increase in blood flow causes accentuation of the sound (or myocardial weakness with a small stroke volume causes a faint first sound) and this too depends on the altered position of the valves due to a prolonged or an abbreviated inflow phase.

¹² D. A. L. The Movements of the Mitral Cusps in Relation to the Cardiac Cycle. Am J Physiol 40: 206 (April) 1916.

Records of heart sounds show that some limitations on the precision of auscultatory diagnosis have been underestimated in the past. The ear does not often serve to distinguish between a true split first sound (or an impurity or muffled quality due to asynchronism) and the changes due to presystolic gallop or to the presystolic vibrations which so often blend into

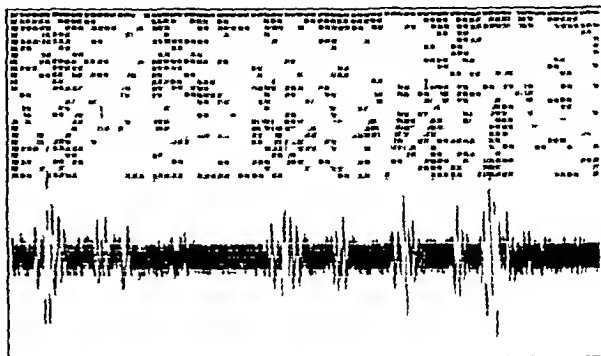


Fig. 6—Two premature beats neither of which was forceful enough to evoke a second sound showing that intraventricular pressure did not reach the diastolic arterial level. The first occurred before the atriculoventricular valves could have opened 0.02 of a second after the first part of the split second sound. It caused no vibrations of audible frequency and intensity. The second occurred 0.10 of a second later and evoked a very loud impure first sound and no second sound.

the first sound even in normal hearts. When a double first sound is heard even with an identical pair of sounds, the usual cause is a gallop. Some authors do not make any attempt to separate presystolic gallop from split first sounds and include the gallop as a "reduplicated first sound." Since split first sound does occur, it saves confusion to speak and think of a double first sound realizing that graphic records may prove this to be due to a presystolic event.

In the evaluation of auscultatory signs at the bedside the nature of the apex beat is of value. If it is double the odds are great that there is a gallop rhythm and that the retraction of the apex which accompanies the third sound or a gallop is so marked as to be seen or felt. This occurs at times when the sound itself is inaudible or very faint. When the first sound is split the apex beat is not often bifid.¹⁰

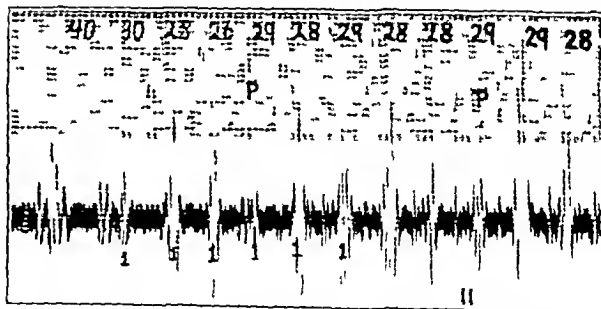


Fig. 7—Ventricular tachycardia with some very loud and some very faint beats. In such a recording the pulse may be barely perceptible but the first sound of some beats is loud. Loud sounds usually follow the longer interval between beats.

When the rate is rapid and a gallop sound is louder than the first sound as often happens in patients with severe failure or in ambulatory patients with failing hearts it is usually difficult to persuade oneself that the gallop sound is not the first sound. Few examiners can successfully time the position of the sounds in the cycle by feeling the pulse or the apex beat when the

rate is high and in such cases slowing the heart even for a few beats during auscultation by pressure on the carotid bulb is often invaluable in clearing up a confusion of sounds (fig 9)

But even when the examiner has correctly identified the nature of the alteration in sounds as gallop or split sound or when the first sound is very faint, the interpretation depends partly on whether auriculoventricular conduction and conduction in the Purkinje system are normal. Delay in activation of the ventricular muscle is often associated with presystolic gallop or a faint first sound, but there may be no other myocardial damage. In such cases the altered sound is not due to heart failure. It now seems clear that gallop associated with bundle branch block (which predisposes to gallop rather than to reduplication¹⁰) has no worse and perhaps a better prognosis than gallop with a normal electrocardiogram. Instead of auscultation freeing one from the need for electrocardiographic aid it actually is necessary in many instances of presystolic gallop or of faint or muffled first sound to see the electrocardiogram in order to grasp the significance of the physical signs. In many cases simultaneous records of the sounds and the electrocardiographic changes are essential to demonstrate whether the extra sound occurs before or after the onset of systole.

It must be stressed that while the first sound and the gallop sounds probably have no muscular element, their variations reflect an altered state of the muscle or of the conduction system. As an early diastolic gallop grows fainter and occurs farther from the second sound, or as a presystolic gallop fades and blends with the first sound, the physician is reassured that the conduction system or the myocardium is functioning more normally, and this is true also if the first sound grows louder and purer. Usually when the pulse is slow, gallop becomes fainter, but at times a mid-diastolic gallop due to summation of both types separates so that there are four heart sounds. Such a phenomenon or even the persistence of gallop at slow pulse rates is uncommon except with severe cardiac damage. When a long-standing presystolic gallop is abolished by the onset of auricular fibrillation an early diastolic gallop

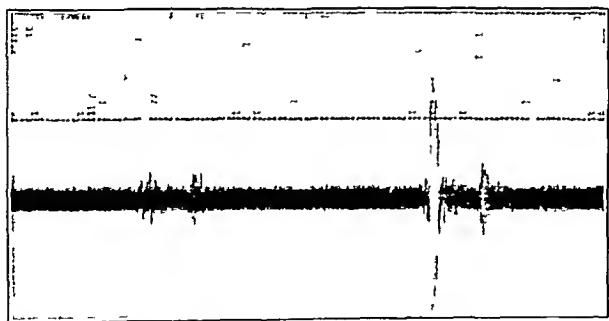


Fig 8.—Complete heart block. Although the QRS duration of 0.14 of a second indicates a markedly retarded activation of the ventricular mass the first sound was loud sharp and not reduplicated when the PR interval was 0.08 of a second (second beat) but almost disappeared when the interval was 0.58 of a second (first beat).

may take its place, but as a rule when this irregularity occurs the quality of the heart sounds in many beats is better than when the rhythm was regular.

These examples serve to indicate that even though the sounds are purely valvular their variations furnish clues to the detection of changes in conduction or in contractile power of the muscle. In the past physicians have often learned to sense the state of the heart with-

out any comprehension of the evidence which guided them, just as frontiersmen, ignorant of botany, zoology and geology, learned to "feel" where game or beaver were apt to be abundant. Graphic records are useful in correcting misimpressions and shortening the time necessary for training the ear and thus in permitting students and physicians to learn how to make more accurate diagnoses at the bedside.

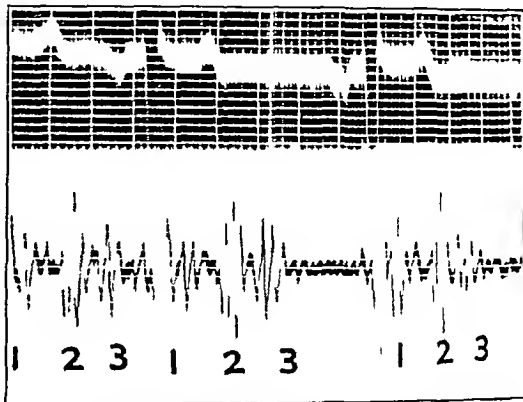


Fig 9.—Pressing on the carotid and reflexly slowing the heart makes a gallop which seemed mid diastolic become fainter and easily recognized as protodiastolic. The first cycle is the normal one, the others show reflex slowing.

CONCLUSIONS

- 1 The heart sounds and the gallop sounds in diastole are due to tension of valve leaflets with no appreciable muscular element.
- 2 The intensity of the first sound depends chiefly on its relation to auricular emptying, passive or active. When systole interrupts rapid ventricular inflow the first sound is loud regardless of all other factors, if systole occurs after such a phase has closed the sound is faint, even though the contraction is vigorous and the myocardium normal.
- 3 The gallop sounds are accentuations or variations of sounds present in many normal persons but while the normal sounds are common in young adults they are rare in normal persons at the age when myocardial failure is most frequent.
- 4 Presystolic gallop and weak first sound are caused either by altered conduction of the activation wave in the heart or by myocardial failure. The electrocardiogram is therefore valuable as an aid in interpreting these signs of disturbed cardiac function.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRs BURWELL AND BLALOCK AND DRs LEWIS AND DOCK

DR CHARLES C WOLFERTH, Philadelphia. I congratulate Drs Lewis and Dock on the clarity of their presentation and the skill with which they marshaled facts in support of the hypothesis that all the heart sounds they mentioned are valvular in origin. However, I think that one should be cautious in accepting this hypothesis in toto. There can be little doubt that the second heart sound is produced by closure of the semilunar valves. I also agree that the opening snap of mitral stenosis is due to the attempt of the crippled mitral valve to open. The sound occurs at the instant the opening movement is checked. Margolis and I showed this a few years ago when various significant cardiac and vascular phenomena were studied in respect to their time relations to this snap. Recently we have been able to show in roentgenymographic tracings of a closed mitral valve that the snap occurred at the instant the

valve reached the lowest point of its descent in early diastole. With reference to gallop rhythm, there are several reasons why I am unwilling at this time to accept the hypothesis presented this morning. The gallop sound is low pitched in comparison with the second heart sound and the opening snap of mitral stenosis. It occurs at a position much lower than that of the opening snap and I fail to see any reason why this should be so if the sound were produced at the valves. Other conditions being so similar at the time of these two sounds. Furthermore, when summation gallop begins to resolve the sound will lengthen out and at times the two components protodiastolic and presystolic gallop will appear side by side. I fail to see how this could occur if the gallop sound was valvular in origin. Finally roentgenkymographic tracings of the left ventricular border appear to show that the gallop sound occurs at the peak of the outward movement, in other words about the time the wave of filling reaches the apex. With regard to the first heart sound this is an extremely difficult subject to investigate. The old teaching that the first heart sound is due largely to the interlacing of muscular fibers as the heart contracts is incorrect. I believe with Drs. Lewis and Dock that closure of the valves has a great deal to do with the production of this sound, but whether it is due to vibrations in the valves themselves or whether it is due to the fact that closure of the valves terminates dissipation of intraventricular pressure so that there must be an abrupt rise of intraventricular pressure at this time is a problem. Abrupt rise of pressure might throw not only the valves but various other structures into vibration. This problem I believe, is susceptible to further investigation, and I think time will show which of these views is correct.

DR WILLIAM DOCK, San Francisco. In standardizing digitalis we use almost entirely tests of its toxic action: its power to produce ventricular arrhythmia or its power to stop the frog's heart in systole. There is an increasing body of evidence that different digitalis preparations, different preparations of powdered leaf may vary greatly in one or more of the ways in which they differ from this toxic action, so that it will be necessary in the future to look into that. I thank Dr. Wolfert for pointing out that what Dr. Lewis and I demonstrated is as yet unsettled. I had a chance to talk with Dr. Houssay when he was in this country last year. I think he agrees with Dr. Wolfert that a great deal more work needs to be done before this theory is accepted, which is a healthy situation. If this thing was settled as it was by a commission a hundred years ago, and nobody did any more work on it it would really be too bad.

DR C. SIDNEY BURWELL, Boston. May I refer briefly to two points. It is a striking fact that on the whole, patients with constrictive pericarditis do not have severe dyspnea at rest unless they have large accumulations of fluid in the pleural cavity. They do, however, have dyspnea on slight exercise. I take it that they do not have dyspnea at rest because they do not as a rule have pulmonary congestion and that they do have dyspnea on exertion because they are not able to increase the cardiac output sufficiently. The second point is concerned with the observations of Drs. Burwell and Blalock with regard to the use of digitalis in patients with constrictive pericarditis. The evidence is that the administration of digitalis to patients with inflow stasis from pericardial scar does not improve their comfort. It appears that the reason for this is that the essential abnormality in the circulation of patients with this condition is concerned with the filling of the heart and is not a difficulty of contraction. However when an operation is contemplated one is faced not only with the situation as it exists in the patients which Drs. Burwell and Blalock have described but also as it will exist when the pericardial scar has been removed from the heart. The heart from which the pericardial scar has been removed will usually do more work than it has been doing. Moreover it may well be an atrophied heart. For these reasons it is the custom in the light of present knowledge to give these patients digitalis before operation. It is hoped that by so doing we may sometimes prevent congestive heart failure based on myocardial insufficiency, which may develop under the new load imposed on the heart after operation has freed it from the constrictive scar.

PATHOLOGIC CONDITIONS OF THE SPINE

PAINFUL DISTURBANCES OF THE INTER-VERTEBRAL FORAMINA

LEE A. HADLEY, M.D.

SYRACUSE, N. Y.

Preliminary to a consideration of disturbances of the intervertebral foramina it will be helpful to review briefly the anatomy and pathology of the intervertebral disk. As so ably stated by Schmorl¹ and others, the disk consists of a gelatinous-like nucleus pulposus surrounded by the annulus fibrosus and separated from the vertebral bodies above and below by cartilaginous plates. Proper function of the disk as a buffer or hydrostatic ball bearing depends on the integrity of the cartilage plates and the annulus fibrosus.

Two distinct types of pathologic changes in disks are encountered. In early life herniations of the nucleus pulposus may take place either through a break

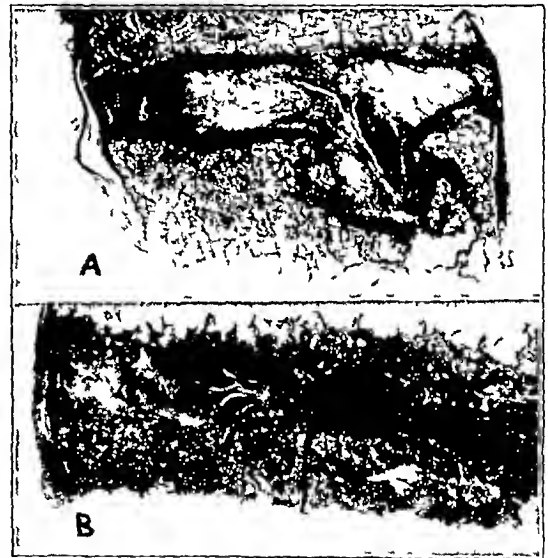


Fig. 1—A early life type of disk degeneration herniation of the nucleus pulposus through the cartilage plate of the disk into the substance of the underlying vertebral body surrounded by bony sclerosis. B later life type of degeneration fragmentation of the cartilage plate and replacement of the disk substance by fibrous tissue and bony trabeculae.

of the cartilaginous plate into the substance of the vertebral body or through the annulus fibrosus into the spinal canal. In the type of change which occurs in later life fragmentation of the cartilaginous plates allows granulation tissue to grow from the adjacent vertebral bodies into the disk. Here it replaces the nucleus pulposus, so that finally the disk becomes merely fibrous tissue or even bone.

Herniations into the vertebral body if surrounded by a zone of bony sclerosis appear on x-ray examination as small semicircular areas of increased density adjacent to the vertebral disk. A large percentage of such hernias, however, cannot be so visualized. Hernia into the spinal canal causing symptoms of pressure on the

This study was assisted by Syracuse University College of Medicine. Read before the Section on Radiology at the Eighty Eighth Annual Session of the American Medical Association Atlantic City, N. J. June 9, 1937.

¹ Schmorl, Georg and Junghanns, Herbert. Die gesunde und kranke Wirbelsäule im Röntgenbild. Leipzig: Georg Thieme, 1932.

cord or nerve roots has been diagnosed by injection of iodized oil, as described by Hunton² and others. In the roentgenogram, degeneration of a disk appears as a narrowing of the shadow of the disk, usually with bony spur formation about its margins.

This thinning of the disk because of pathologic change brings the vertebral bodies closer together (fig 2). If the posterior articulations do not slip past each other, kyphosis results, a condition usually encountered

in the lower vertebra forward beneath the one above, so that distortion and constriction of the intervertebral foramen is produced.

In extreme cases of apophysial subluxation, results from bony impingement of the tip of the articular process against the pedicle above or the lamina below (fig 3).

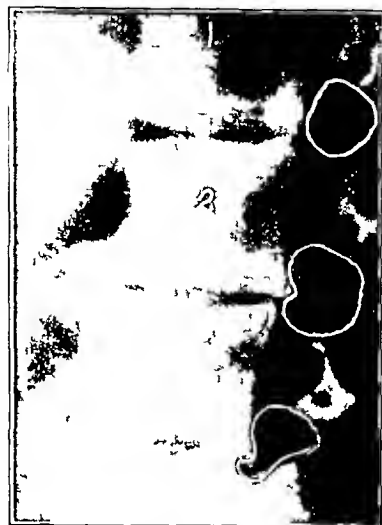


Fig. 2—Thinning of disk between second and third bodies without posterior joint subluxation and with normal foramen. Thinning of third-fourth disk with subluxation of posterior joints forcing fourth body forward beneath third and constricting third foramen. Kyphosis between second and third bodies.



Fig. 3—Normal disk and posterior articulations between the third and fourth bodies. Thinned disk with subluxation of the posterior articulations between the fourth and fifth bodies (retouched).



Fig. 4—A normal S-curve and posterior articulations between third and fourth bodies. E, subluxation of the posterior articulation with a break in the S-curve at both third-fourth and fourth-fifth levels.



Fig. 5—Traumatic angulation forward of the fourth cervical articulation on the fifth. Subluxation of the posterior articulation.



Fig. 6—Fusion of the fifth and sixth cervical segments.



Fig. 7—Bony constriction of the third and fourth cervical foramina by exostoses. Severe neuralgic pain of brachial plexus distribution resulted. Other vertebrae normal.

in the dorsal and upper lumbar regions. In the cervical and lower lumbar areas, however, when the disk becomes thinned the posterior articulations are likely to override, producing the so-called apophysial subluxation. Because of inclination of the plane of these articulations, subluxation may result in wedging

Notches may actually be eroded in the bone by the pressure, a condition well visualized in the 45-degree oblique view or in the anteroposterior view by a break in the S-curve (fig 4).

THE S-CURVE

In the anteroposterior view, entering through the intervertebral disk of normal thickness in the lower lumbar region, an S-curve is formed by a line will

² Hampton, A. O. and Robinson, J. M. The Roentgenographic Demonstration of Rupture of the Intervertebral Disk into the Spinal Canal After Injection of Lipiodol. *Am. J. Roentgenol.* 36: 782-803 (Dec.) 1936.

the under surface of the transverse process and the lateral surface of the inferior articular process and extending across the apophysial joint and along the lateral surface of the superior articular process from the body below. In case there is an apophysial sub-



Fig 8—Section of normal intervertebral foramen with nerve in the center. $\times 7$

luxation, such a view shows a jog in the S curve at the point where the posterior articulations have slid past each other.

Scoliosis does not produce subluxation if sufficient rotation of the vertebral bodies has taken place.

In cases of marked lordosis some of the patient's weight may be thrust backward onto the posterior articulations, with the production of extreme apophysial subluxation even without thinning of the disk, while as a result of strain or thinning of the anterior portion of the disk a reverse subluxation of the apophysial joints may be visualized as a pulling apart of the articular processes.

After a strain of the neck the normal anterior curve of the cervical part of the spine may be replaced by a posterior curve or an angulation at one point. The latter, in the absence of fracture, indicates a reverse subluxation of the posterior articulations at the point of angulation (fig 5). After the complete subsidence of all symptoms the angulation may persist.

Fusion of adjacent vertebral segments is common in the cervical region (fig 6). Either the bodies or the posterior articulations may be united. One posterior articulation alone may be fused. In cases in which the condition is congenital the walls of the foramen are smooth. Acquired fusion resulting from degeneration of the disk may reveal bony spurs projecting into the lumen of the foramen.

Sections of the intervertebral foramina in cases of subluxation reveal encroachment of this structure by masses of connective tissue from the posterior joint

capsule and the disk margin. The structure is also constricted by a decrease in both its cephalocaudal and its anteroposterior diameters as a result of the changed relationship of the adjacent vertebral bodies. A third cause of constriction of a foramen particularly in the midcervical region, is the presence of bony exostoses projecting from the vertebral disk into the lumen (fig 7).

As a result of these three conditions there is crowding of the nerve root, with the occurrence of actual fibrosis in some cases (figs 8 and 9).

SYMPTOMS

In addition to the characteristic X-ray appearance, patients have pain and tenderness to deep pressure in the neck or back, with restricted motion and muscle spasm. Muscle spasm tends to maintain the overriding causing a continuance of the pain. Referred symptoms are those of radiculitis, the pain corresponds in distribution to that of the involved nerve root, brachial, intercostal, abdominal and sciatic being the principal divisions. There may be disturbance of the reflexes, muscle atrophy or Dejerine's sign—that is, pain of nerve root distribution on coughing, sneezing or bearing down. The patient does not complain of pain on pressure along the course of the nerve, but the nerve roots are painful to deep pressure along the spine. Homolateral or contralateral scoliosis may be present.

SUMMARY

There are two distinct types of pathologic change in the intervertebral disk which produce thinning of this structure. Thinning allows the vertebral bodies to approach each other so that apophysial subluxation



Fig 9—Foramen encroached on by exostoses from the intervertebral disk, nerve crowded into the lowermost portion. $\times 7$

or slipping of the posterior joints may result. Pain may be caused by bony impingement of the tips of the subluxated articular processes or by constriction of the intervertebral foramina. Extreme lordosis favors subluxation of the posterior joints. Bony exostoses in the midcervical region produce encroachment of the foramina. Angulation of the cervical part of the spine

is traumatic. Fusion of adjacent segments of this portion of the spine is common and may be congenital or acquired. The symptoms are both local and referred.

Medical Arts Building

ABSTRACT OF DISCUSSION

DR WILLIAM E CHAMBERLAIN, Philadelphia. While pain in the lower part of the back is sometimes caused by the mechanisms that Dr Hadley has shown most of the time it is caused either by several factors or by something else than what is believed to be the cause. Otherwise there would not be so little success in treating it. I suspect that every one knows I use sacro-iliac belts. Some patients with pain in the lower part of the back who show exactly the x-ray appearances that Dr Hadley has pointed out prove their pain to be something else. No matter what is done one does not get results, or the patient recovers spontaneously and what was causing the episode in the lower part of the back is never found out. I use the terms postsynchondrosis and presynchondrosis. The comparative anatomist has precise words for these parts. Instead of speaking of an anterior or ascending or superior articular process, he says presynchondrosis. Presynchondrosis is the process reaching forward for articular purposes, and postsynchondrosis the process that is reaching backward for the same purpose. With regard to the hypertrophic fringes one of the important things to know in the clinical radiologic study of pain in the lower part of the back is that a patient can have one awful group of these great big fringes and not have a single symptom. I saw a woman, aged 80, whose spine looked like that of a young girl. It did not show any of the osteo-arthritis fringes or osteophytes. It was free from that sort of thing. She stated that she never did anything in the way of work in her life. Then I went down on the waterfront of San Francisco and hunted up a stevedore who could lift almost anything. This man, who could lift seven or eight hundred pounds, never had a backache in his life. "Well," I said, "you're the man I'm looking for, a man who has never had a backache in his life, and I am going to ask you to come to the hospital and be x-rayed." Roentgenograms showed that he had these big osteophytes, huge ridges of bone, reaching across from one vertebra to the next. Some joints were completely fused, and that man had never had a backache. Suppose we tell the industrial surgeon that those fringes have something to do with low back pain? We are going to be in trouble right away. The absence of correlation between these fringes and the patient's symptoms is a very tricky fact.

DR D Y KEITH, Louisville, Ky. Dr Hadley has helped us a great deal on this subject. He stated that in making films of the cervical spine he made one a true lateral and one tilted 15 degrees to the feet and 45 degrees to the face. I should like to know and I am sure other members present would like to know, whether he uses the same rotation of the tube in making films of the lumbar spine to bring out the lateral masses.

DR LEE A HADLEY, Syracuse, N Y. Exostoses are of insidious development. I have a specimen in which the intervertebral foramen has become completely obliterated and the nerve has developed a new foramen anterior to it through the side of the vertebral body. Individuals developing exostoses are probably unaware of their condition until injury occurs, but they have decreased their limit of safety in motion and their spine will not tolerate as extreme a degree of flexion, rotation or sudden motion as a spine that does not have these exostoses. Most exostoses occur on joints that support weight and help to stabilize the joint. In certain cases of scoliosis there are massive exostoses on the inner side of the curve. To visualize the intervertebral foramina of the midthoracic region, the patient sits with the sagittal plane 45 degrees to the film. The central ray is directed postero-anteriorly at an angle of 15 degrees from the head toward the foot. The posterior articulations in the lower lumbar region are visualized by turning the patient 45 degrees from the true anteroposterior toward the side to be studied and centering over the small depression in front of the anterosuperior iliac spine. These studies may be made with the patient in the vertical or the horizontal position.

ARTHRODESIS OF THE OSTEO-ARTHRITIC HIP

R. WATSON-JONES, M.Ch. Orth., F.R.C.S.
LIVERPOOL, ENGLAND

In the later stages of osteoarthritis of the hip joint there are two main sources of incapacity—the pain on movement and weight bearing, and the stiffness of the joint. Which of these elements of the disability is the more incapacitating? There can be no doubt that pain is the dominant factor. Patients with completely stiff hips and no pain have extraordinarily little disability. On the other hand, patients with one-third or one-half normal movement may be unable to walk 100 yards.



Fig 1—Nail driven into acetabulum from the front of the femoral neck at the time of the open arthrodesis. This technique has been shown in the film. Fixation is certain only if the nail lies in the middle of the neck and enters the roof of the acetabulum.

owing to pain. In treatment, therefore, abolition of pain must be the primary consideration.

Arthroplasty of the hip can usually be relied on to increase the motion of the joint, but it cannot be relied on to relieve pain. There may be some improvement, but neither by arthroplasty nor by osteotomy can one promise complete and permanent relief, one cannot promise the ability to walk 5 or 10 miles without difficulty. Furthermore, there is no permanence, adduction and rotation deformity frequently recur—with increasing shortening with an increasing lump and with increasing incapacity.

It would appear, therefore, that in cases of unilateral osteoarthritis of the hip joint in which the joint is almost entirely destroyed arthrodesis should be the treatment of choice. It has not been the treatment of choice for two reasons: (1) the surgeon has been

Read before the Section on Orthopedic Surgery at the Fifty-Eighth Annual Session of the American Medical Association, Atlantic City, June 10, 1937. Illustrated by films of operation and of results in thirty cases.

unable to rely on sound bony fusion (in about 50 per cent of the cases consolidation did not take place, so that symptoms recurred) and (2) it has been believed that arthrodesis produces or aggravates pain in the back. I propose to report a technic by which successful consolidation may be assured. I shall also report the results in fifty cases, which prove that painless stiffness of the hip accounts for minimal incapacity, that it seldom aggravates the pain in the back and that in some cases it may even relieve it.

What was the reason for the frequent failure of arthrodesis in the past? Like any other connective tissue, bone is repaired most rapidly if tearing of the young growing tissue is prevented by complete immobility. Rotational and shearing strains delay repair and may cause nonunion. A plaster spica, however carefully applied, cannot completely prevent rotational movement of the hip joint, especially in the obese patient. This was the reason for the frequency of nonunion in cases of fracture of the neck of the femur treated in a plaster spica. The success of the Smith-Petersen nail depends entirely on the three flanges which prevent rotation.

The union of hip joints by arthrodesis is exactly comparable. It matters not whether the bone is sclerosed from disease or atrophied from age. The clue to successful fusion, after the joint is denuded of cartilage, is control of rotational movement, a control which cannot

be assured by the plaster spica but which can be assured by a three flanged nail driven from the femur into the pelvis.

I first described this method of arthrodesis in 1934.¹ In the earlier cases the nail was driven from the front of the neck of the femur into the floor of the acetabulum (fig 1). This wall of the pelvis, however, is sometimes very thin and it may afford inadequate fixation. Even trivial movement of the joint may prevent bony fusion, absolutely sound fixation by the nail is imperative. In all later cases therefore the nail has been driven from the cortex of the femur below the trochanter into



Fig 2—The position must be confirmed radiographically in the lateral plane to make certain that the nail will enter the thick bone ridge between the acetabulum and the sacro-iliac joint.

the roof of the acetabulum where there is a 1 inch (2.5 cm) thick bar of bone running up to the sacro-iliac joint. The average length of nail is from $4\frac{1}{4}$ to $5\frac{1}{2}$ inches (12 to 14 cm). Accurate placing is of such importance that I now always use

cannulated nails preliminary guides and radiographic control in both anteroposterior and lateral planes (fig 2). A plaster spica is applied and the patient is recumbent for about three months.

A completely successful result depends not only on firm consolidation but on fixation in the ideal position. The femur must be as nearly as possible at right angles with the pelvis, it is as wrong to produce an abduction deformity as to allow an adduction deformity. Strictly



Fig 3—Hip permanently fixed by nail introduced subcutaneously without open arthrodesis. The nail must be buried in bone, early sliding is now prevented by a cross pin. Roentgenograms two years after operation show complete obliteration of the joint space but there is no proof of spontaneous bony ankylosis.

neutral rotation, with the patella and foot directed forward is essential. Finally the hip must not be deliberately flexed. As the patient lies flat on the operating table with his shoulder, buttocks and heels touching the table, there is always lumbar lordosis sufficient to produce from 25 to 30 degrees of flexion deformity. This is sufficient for comfortable sitting, and if the hip is flexed more than this the patient walks badly.

In the first thirty-seven cases there were two post-operative deaths. There is always a good deal of shock, so that I now do a two stage operation, the open operation first and the nailing and application of the plaster spica from ten to fourteen days later. The striking feature in contrast with previous results of arthrodesis, is the constancy with which bony fusion results. The only failures were due to failures in technic, in one case the nail was too short, so that it was not effective at all and in two others the nail was imperfectly placed so that the joint was not locked. At the end of the operation it was still possible to elicit some degree of rocking and rotational movement and in each case the result was a fibrous union. After second operations, with refusion and efficient renailing, bony union was secured and the results are now classified as successful.

When the joint is stabilized in the ideal position, patients walk and run with a barely appreciable limp. It is often impossible to know that there is any abnormality of the hip. Many of the women do their own housework, polishing, cooking, climbing stepladders and scrubbing floors. One aged 50 who before operation could walk only 50 yards with two crutches, now plays

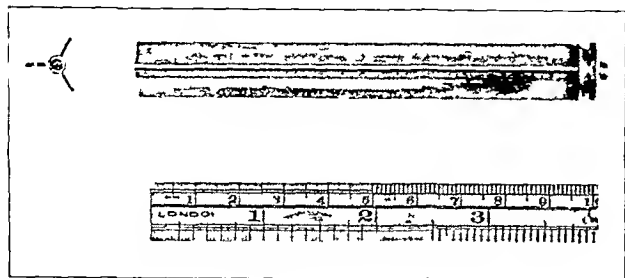


Fig. 4.—The ordinary Smith Petersen nail is 12 mm wide and of 1 mm thick steel. For the open arthrodesis this nail should be used and a plaster spica for three months.

tennis and badminton regularly. One man is a plate layer on the railway and walks 12 miles every day, another does full work as a porter, while another works in a quarry. Several drive their cars and all can walk from 5 to 10 miles without a stick and lead normal lives. The only disability, which is fairly constant, is difficulty in tying the shoe-lace on the affected side.

The other striking feature is the absence of serious pain in the back. Some patients have a slight ache when tired, but in no case is there incapacitating pain in the back. In osteo-arthritis of the hip pain in the back is due either to deformity of the hip with secondary lordosis, scoliosis and lumbar strain or to unsmooth ankylosis with muscle spasm. For this reason a successful arthrodesis may even relieve pain in the back. Several patients believed that the operation increased their movement. With freedom from pain, the muscle spasm subsides, and from 30 to 40 degrees of pelvic movement develops, which stimulates hip movement. It is not always wise therefore to explain the operation to the patient as a stiffening operation.

EXTRA-ARTICULAR SUBCUTANEOUS ARTHRODESIS

The complete operation is too formidable a procedure for older patients, from 60 to 75. The shock of the

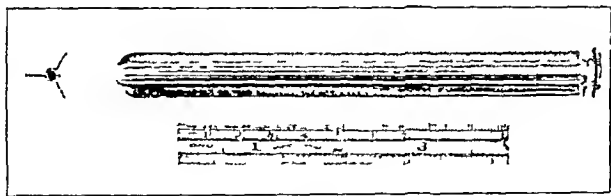


Fig. 5.—For the subcutaneous operation when there is no other protection a heavier nail 15 mm wide of 3 mm steel must be used despite the greater risk of splitting the femur.

operation, the dangers of three months recumbency in plaster and the intractable stiffness of the knee debilitate these patients from the relief the operation can afford.

In thirteen cases I have permanently immobilized the hip joint by the nail alone without any intra-articular procedure (fig. 3). With the patient under spinal anesthesia the deformity is corrected and with radiographic control the nail is driven through a 2 inch (5 cm) incision. The patient is allowed up resuming weight bearing in from ten to fourteen days without

any splint and without plaster. The head of the nail is buried in the cortex just sufficiently to allow a bridge of bone to develop over it and prevent it from sliding out, so that it remains permanently in the bone. Sliding during the first few weeks must be prevented by a nail driven through the head of the nail at right angles to it across the femoral shaft.

In the first three cases, the ordinary sized nail was used. When the joint is already almost completely stiff, this thickness of steel is sufficient. But the third patient had 60 degrees of hip movement before operation. She was not yet accustomed to a stiff hip and she fractured the nail three weeks later. The nails now used are much heavier and stronger. Laboratory tests show that the ordinary nail with its thin steel can easily be fractured. Even a nail of much heavier steel can be bent by a load of 150 pounds (68 kg) at the end of a 3 foot (91 cm) lever, so that I use a 15 mm nail of thick steel (figs. 4 and 5).

The first operations of this type were performed two years ago and the results are still satisfactory. Pain is completely relieved, and the joint remains firmly fixed by a simple procedure. There are however, certain risks which do not apply to the open operation. There is a greater danger of splitting the bone and fracturing the femur and the result depends on the strength of the steel nail and on the development of a cortical bridge of bone over the head of the nail before any sliding occurs.

88 Rodney Street

SOME PROBLEMS IN SURGICAL TREATMENT OF THE PROSTATE

HUGH H. YOUNG, M.D.
BALTIMORE

It is now several years since the wave of enthusiasm for transurethral operations on the obstructive prostate reached its climax and the time seems ripe to take stock and see what has been accomplished. Perhaps a recital of some of my own experiences may be in order.

Beginning a good many years ago with my urethroscope, prostatic excisor, or punch and finding it very satisfactory for benign contractures and small lobes, in which it was first recommended, I was tempted to use the instrument for larger and larger prostatic obstructions but eventually came to the conclusion that it had best be attacked by a clean enucleating operation. With the promulgation of electrical modifications the use of transurethral methods spread rapidly and the technique was proclaimed as the final solution of the prostatic problem.

But is such the case? Is transurethral resection safe and as radically curative as open operation? A considerable literature has accrued, and the subject has recently been studied in great detail,¹ but I will cite a few of my own experiences.

A physician came to me with the following history (case 1). He had suffered from moderate obstructive

From the James Buchanan Brady Urological Institute, Johns Hopkins Hospital.
Read before the Section of Urology at the Eighty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June 9, 1937.
1. Young, Hugh H. Surgery of the Prostate in Nelson, J. L., ed. Urology, New York: Thomas Nelson & Sons, 1933, ch. 13.

to urination, and a transurethral resection had been carried out. He said the operation required over two hours and left him incontinent. Examination showed that the median and the right lateral lobe had been completely removed along with a portion of the external sphincter. There remained a globular left lateral lobe, which produced obstruction and pain. This was easily enucleated (fig 1), and an operation to cure the incontinence on the sphincters was done with fairly satisfactory results.

Another patient had had a transurethral resection and presented marked symptoms of frequency and irritation (case 2). A severe infection was present. The prostate was enucleated perineally, and the tissue removed weighed 81 Gm (fig 2). An excellent result was obtained.

Another patient had been subjected to two transurethral resections (case 3). Cystoscopy revealed that although the median lobe had been completely removed, two large lateral lobes persisted. These were easily enucleated through the perineum, they weighed 178 Gm (5½ ounces) (fig 3). The operative result was entirely satisfactory.

In another case the mass enucleated by perineal prostatectomy weighed 270 Gm (fig 4), and in another the weight of the enucleated prostatic tissue was nearly 700 Gm.



Fig. 1 (case 1)—Lobe removed at operation weight 15 Gm

The argument offered by surgeons advocating transurethral resection for large prostates is the danger and difficulty of prostatectomy and the low mortality of the transurethral operation. Is this attitude justifiable? In his splendid and frank study of 800 patients, whom he had subjected to transurethral resection, Alcock demonstrated that the mortality increases rapidly with the amount of tissue removed as shown in the accompanying table. It has been stated by

Mortality in Relation to Amount of Tissue Removed by Transurethral Resection in 800 Cases (Alcock)

Tissue Removed Gm	Number of Cases	Percentage	Deaths	Mortality Percentage
0-10	59	11.1	3	3.0
10-20	28	4.4	20	3.3
20-30	17	2.4	19	1.7
30-40	7	9.0	7	9.0
40-50	-	4.6	2	5.4
50-60	27	2.8	3	1.1
60-70	1	1.6	1	7.8
70-80	4	0.5	0	0.0
80-90	5	0.4	0	0.0
90-100	5	0.3	0	0.0
100	1	0.1	0	0.0
Over 100	1.5	19.7	13	8.2

other writers that the operation is practically without mortality and may be applied to prostates of any size and repeated a number of times with impunity. A conservative analysis of the literature indicates that this is not the accepted opinion and that the results obtained have gradually forced operators to recognize that trans-

urethral surgery has definite limitations that it has proved a splendid procedure in a certain group of cases but that for others prostatectomy is much to be preferred. The argument that perineal prostatectomy is too difficult is disproved by our experience at the Johns Hopkins Hospital with consecutive resident urologists who have had no difficulty in mastering the technique.

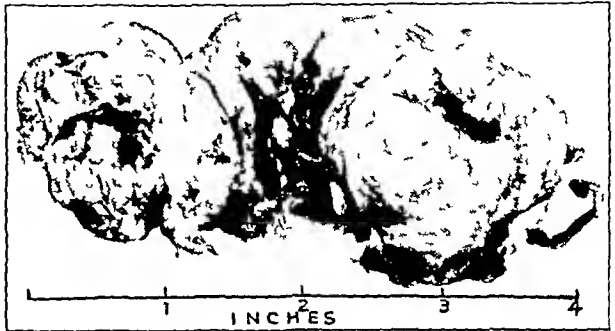


Fig. 2 (case 2)—Tissue removed at operation weight 81 Gm

As a matter of fact the past four resident urologists at our clinic have operated on 190 consecutive patients with only three deaths (1.5 per cent). One of these residents did sixty-eight consecutive perineal operations without a single fatality. These were on unselected patients in public wards.

Another objection to the universal adoption of transurethral resection is the great frequency of carcinoma of the prostate. In 292 consecutive autopsies on men past 41 years of age Rich² observed cancer in 14 per cent and in 242 routine autopsies Moore³ actually observed carcinoma in 21 per cent. In Moore's studies carcinoma of the prostate was at least three times as prevalent as cancer in any other deep



Fig. 3 (case 3)—Lobes removed at operation weight 178 Gm

serted organ. These startling statistics have placed on the medical profession a great responsibility in the duty to use every effort to recognize carcinoma of the prostate sufficiently early for radical cure. The fact that large rounded lobes projecting into the bladder are seen with the cystoscope does not exclude the

2 Rich Arnold R. On the Frequency of Occurrence of Occult Carcinoma of the Prostate. *J Urol* 33: 215 (March) 1935.
3 Moore Robert A. The Morphology of the Small Prostatic Carcinoma. *J Urol* 33: 224 (March) 1935.

presence of cancer, which usually occupies the posterior subcapsular portion of the prostate, where it can easily be palpated by rectum. In fact, 50 per cent of carcinoma is shown to be accompanied by benign adenoma of the lateral lobes, the two diseases being separate and distinct in many cases for a considerable period.

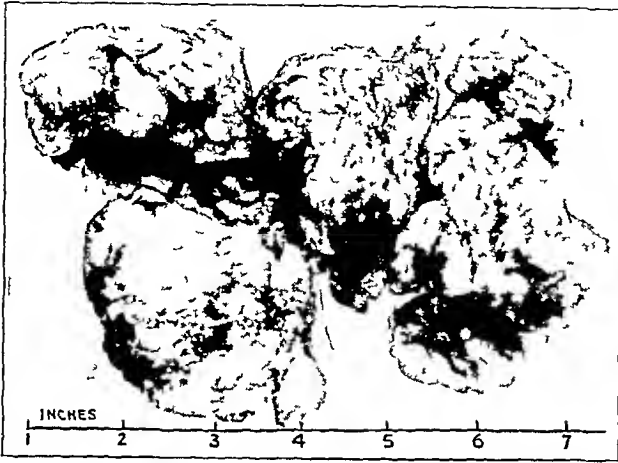


Fig. 4 (case 4).—Median and lateral lobes removed by perineal prostatectomy. weight of specimen 270 Gm.

Carcinoma of the prostate is characterized by induration of third degree, and if only a small nodule of this character is made out on rectal examination, carcinoma should be suspected and the patient subjected to a

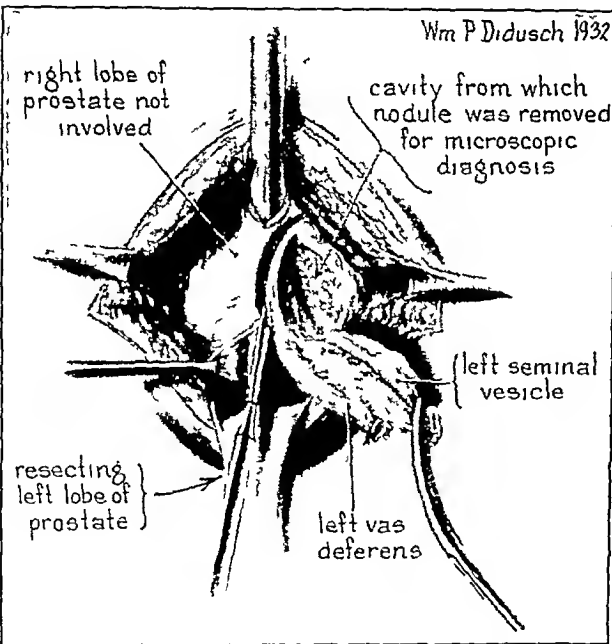


Fig. 5 (case 5).—Hemiprostectomy and vesiculectomy after excision of a nodule shown microscopically to be carcinoma the defect was covered by fascia.

perineal operation to expose, palpate or excise the nodule if necessary for diagnosis. In some such cases a simple hemiprostectomy will be sufficient to obtain a radical cure. In the majority of operable cases it is wise to carry out a complete removal of the prostate and its capsules, with a portion of the trigon and seminal vesicles. The defect is closed by suturing bladder to urethra.

In a recent study of the results obtained in cases in which five years had supervened since the patient left the hospital, I¹ showed that in over 90 per cent a radical cure was obtained. That this large percentage of good results is procurable is not surprising since the prostate is surrounded by three encapsulating fasciae, which prevent, for a considerable period the extension of carcinoma downward and backward to adjacent organs, thus rendering a chance of a radical excision more feasible.

With the recognition by the medical profession of the great frequency of carcinoma of the prostate and the ease with which it may be recognized on rectal examination at its inception, many more cases suitable for the radical operation should be brought to operation. These facts are in themselves a strong argument for the employment of the perineal route in prostatic operation. Reports on hundreds of patients subjected to transurethral resection without a single effort to obtain a radical cure of prostatic carcinoma seem indefensible.

Figure 5 shows the operation carried out on a patient who had a small nodule of carcinoma in the upper left lobe of the prostate (case 5). The nodule

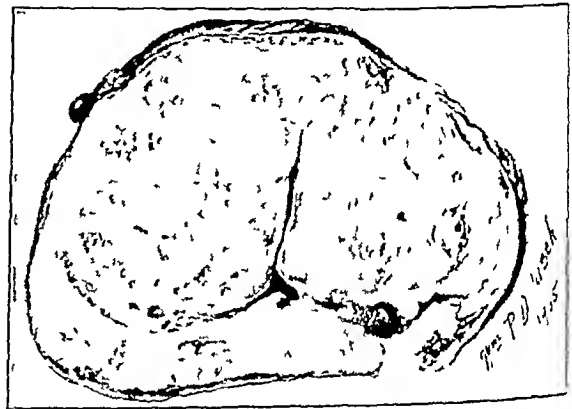


Fig. 6 (case 6).—Cross section of prostate removed by radical operation for cancer showing adenomatous hypertrophy of the lateral lobe with great widening of the urethra. Carcinoma of the posterior lobe of the prostate was unaccompanied by invasion of the lateral lobes. The defect shown in the posterior portion is due to biopsy.

measured about 7 by 10 mm and was immediately beneath the capsule. The diagnosis was made clinically by third degree induration and confirmed by microscopic study of the frozen section after the nodule was excised by perineal operation. One half of the prostate with the seminal vesicle and the ampulla of the vas deferens, was then removed as shown in the illustration. The defect was covered by drawing the posterior fascia over it and suturing to the right side of the prostate. The immediate result was excellent, and the patient has now been observed five years and shows no evidence of recurrence.

In figure 6 is shown a cross section of a specimen removed by radical operation in a case in which there was a more extensive involvement of the posterior portion of the prostate (case 6). The diagnosis was confirmed by section of a small area shown as a defect in the illustration. The entire prostate with a cut of bladder and seminal vesicles was removed and the bladder anastomosed to the membranous urethra. Immediate convalescence was good and the patient well four years after the operation.

SUMMARY

The present status of the prostatic problem can, I believe, be fairly stated thus: Transurethral operations have proved satisfactory in the treatment of obstructive conditions at the vesical neck, particularly contractures, bars and moderate enlargements. When the disease has progressed much beyond this stage, according to statistics of a great number of operators, enucleation of the prostate, preferably through the perineum, is the method of choice. By this means it is possible to see and feel the prostate, which is brought down by the tractor so that it may be carefully examined and even a portion excised for microscopic study, if necessary. In this way the presence of early malignancy may be detected and radical operation carried out. If the process is not malignant (and in about one in five cases it is) an enucleation of the hypertrophied lobes from within the prostate may be carried out cleanly, the hemorrhage completely arrested by ligatures and sutures and the operative wound closed. By such means not only does one carry out a clean surgical job, but one has the satisfaction of avoiding the sloughs and infection which not infrequently persist for a considerable period after transurethral operations and lead to painful prostatitis in the remaining gland tissue, cystitis and irritation, symptoms which are not infrequently worse than those of obstruction.

ABSTRACT OF DISCUSSION

DR N G ALCOCK Iowa City. A year ago Dr Young visited Iowa City and at that time he and I talked over at some length this problem of prostatic surgery. He and I agreed that for him perineal prostatectomy was the operation that he should do and that for me transurethral prostatic resection was the method that I should carry out. I repeat what I have said many times before: that if I could do a perineal prostatectomy as well as Dr Young can, I would probably do all my cases by that method. It has been said that the surgeon should make the type of surgery fit the particular condition that exists in the patient and that this principle should apply especially to the surgery of the prostate. It is stated that there is one type of prostatic enlargement that should be relieved by perineal prostatectomy; that in another type of hypertrophy one should use the suprapubic approach, and that in certain other types of obstruction the relief should be brought about by the transurethral prostatic resection. I think that there are very few who will disagree with the theory of this general principle. Yet what does one find in actual practice? I am attempting to relieve all of my patients—or practically all of them—by the transurethral method. Dr Young is doing almost all of his by the perineal method and at Rochester Dr Verne C Hunt did all of his by the suprapubic method. That certainly is not fitting the surgery to the patient and yet I think we shall have to agree that the patient is receiving excellent service. The answer is that the surgeon should do that operation which in his hands will give the patient the best result. In sizing up the results of many series of reported cases on prostatic surgery the thing that interests me more than anything else is the type of case with which the surgeon is dealing. And there is no one factor that evaluates or tells or gives the picture of the entire group as accurately as the average age and the distribution of the patients in the different age groups. In one series of 1500 cases of prostatectomy that I saw in the literature only 16 per cent of the patients were over the age of 70. One third or 570 were under the age of 60. That group of cases represents the good risks, and the mortality by any method should be very low. Compared to that is a series of 1500 cases I reported in which 64 per cent of the patients were over the age of 70 and only 5 per cent under the age of 60. In the first mentioned series there were only eight patients over 80 while in my group there were 148 over 80. In Dr Young's table of 198 patients there were 29 per cent over 70 and 19 per cent under 60. I think that group represents a fair cross section of the average. Again

let me say that I have no quarrel with men who do prostatic surgery by any of the different methods and I have only compliments for the surprisingly good results that they get, and I say "surprisingly" because I think urologists do get remarkable results in prostatic surgery when one takes into consideration the type of individual with which they have to deal.

Clinical Notes, Suggestions and New Instruments

A PREMATURE INFANT WEIGHING 735 GRAMS AND SURVIVING

SAMUEL J. HOFFMAN, MD, J. P. GREENHILL, MD, AND
EVELYN C. LUNDEEN, RN, CHICAGO

A review of the literature reveals that few infants weighing less than 1,000 Gm at birth survive. Ylppo¹ states that the lower limit of viability is about 800 Gm. The smallest infant for which a complete report appears in the literature is that reported by Helene Fischer-Birn.² This infant weighed 600 Gm at birth and 540 Gm after three days. She regained



Fig. 1—Sloughing of left thigh and abdomen.

her birth weight in ten days and at the time of the report was 3 years old, small but otherwise normal. Pulford and Blevins³ report a six-month premature infant weighing 680 Gm; the child was over 2 years old when the report was made. Houltham⁴ described a case of a six and one-half month premature infant weighing 705 Gm. This case was especially

From the Pediatric Department of the University of Illinois College of Medicine.

¹ Ylppo, A. *Ztschr. f. Kinderh.* 24: 1, 1919.

² Fischer-Birn, Helene. *Klin. Wchnschr.* 10: 1334 (July 18) 1931.

³ Pulford, D. S., and Blevins, W. J. *Premature Infant*. Birth Weight 680 Gram, with Survival. *Am. J. Dis. Child.* 26: 797 (Oct) 1928.

⁴ Houltham, J. D. *Practitioner* 130: 608 (May) 1933.

interesting in that no human milk was available, so that the child was artificially fed from birth and kept in an improvised incubator heated by a coal stove



Fig. 2—Premature infant at 35 days and scar formation with healing of left thigh

Dunham and McAleney³ reported that in a series of 245 premature infants all those under 1000 Gm died

Julius H. Hess⁴ had a series of 761 premature infants in his station at the Sarah Morris Hospital up to 1930. Of

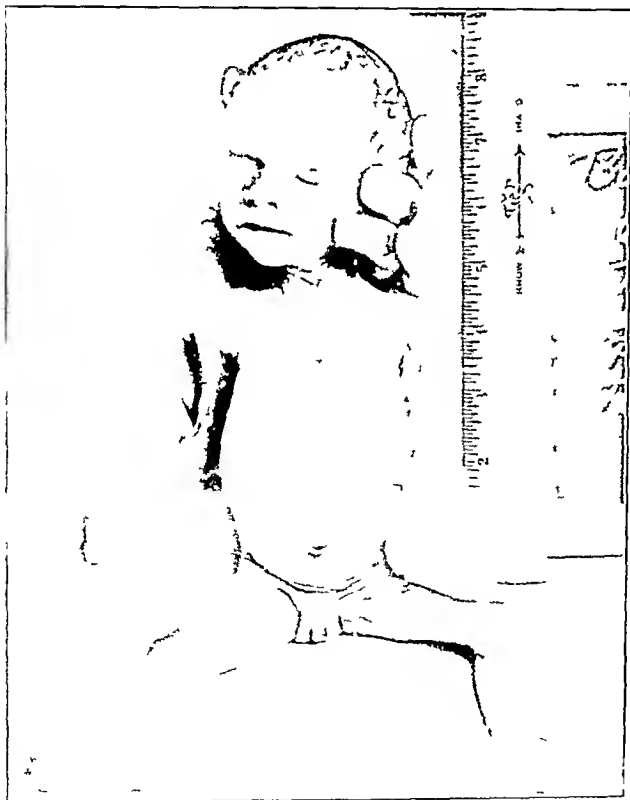


Fig. 3—Appearance of premature infant at 25 days

forty-two infants weighing less than 1000 Gm at birth four survived and graduated from the station. The smallest weighed 840 Gm at birth.

³ Dunham, E. C. and McAleney, P. F. Jr. *J. Pediat.* 9:1 (Dec.) 1926.
⁴ Hess, J. H., Chamberlain, I. M. and Lundeen, Evelyn C. *Penn.sylvania M. J.* 33:429 (April) 1920.

REPORT OF CASE

Mrs. M. S., a primipara aged 26, the mother of a premature infant whose last period began Feb. 9, 1923, was first seen by one of us (J. P. G.) April 4. The history and course of pregnancy were entirely normal until August 19, when she suddenly experienced uterine contractions and was admitted to the Chicago Lying-in Hospital. Labor progressed in spite of efforts to stop it. When the cervix was completely dilated in order to save the infant from every preventable injury it was delivered through a small episiotomy with a specially constructed pair of tiny obstetric forceps. A very small tracheal catheter was used to clear the air passages of mucus and the baby was put into a warm cabinet. Carbon dioxide oxygen was used frequently during the night because of cyanotic attacks and a few drops of lactose solution was given frequently. The next morning the infant was transported to the Sarah Morris Hospital Premature Station in an ambulance incubator and put into an oxygen incubator bed.



Fig. 4—Appearance of infant at 1 year

The baby weighed at birth 735 Gm, was 30 cm long and was cyanotic on admission to the hospital. An ecchymotic area which later became gangrenous extended over the outer upper third of the left thigh and abdomen. This later sloughed but healed rapidly in thirty-five days (figs. 1 and 2). Feedings were started when she was 38 hours old and consisted of breast milk every three hours; the first feeding began with 10 drops, then increasing to 12, 20, 25, 30 and so on until by the end of the fifth day she was getting 55 cc. The first few times an attempt was made to feed by dropper but this caused cyanosis so that gavage feedings were used thereafter up to the thirty-second day. Whisky from 3 to 6 minims (0.2 to 0.4 cc) was given every three hours with the feeding on the first nineteen days. Intramuscular blood from 4 to 10 cc was given every other day and saline solution and dextrose were given twice daily for the first ten days, then about twice a day as needed up to a total of sixteen injections.

Feedings were breast milk in increasing quantities up to the thirteenth day when skimmed lactic acid milk was substituted.

⁵ Hess, J. H. *Heated Bed for Transportation of Premature Infant*. *J. A. M. A.* 80:1313 (May) 1923.

On the fifteenth day the feeding consisted of 60 cc of breast milk and 16 cc of skimmed lactic acid milk, this proportion was followed by minor variations up to the forty-fifth day, after which the amount of breast milk was gradually decreased and the infant finally put on a chymogen milk formula on the one hundred and tenth day. From 4 to 6 cc of tea was given between feedings to increase fluid intake. For the first month the caloric intake did not exceed 90 calories per kilogram.

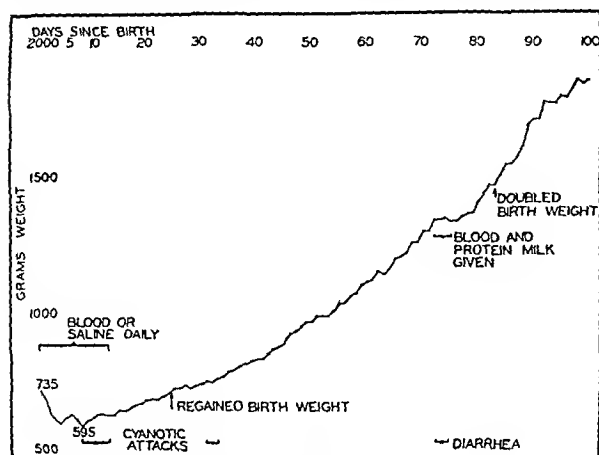


Fig 5—Showing initial loss and gain in weight

Liver and iron was started on the seventy-fifth day, one-sixteenth teaspoonful added to the day's formula and gradually increased to one-fourth teaspoonful daily. Habbut liver oil with viosterol and orange juice each 2 drops daily, were started on the eighteenth day and gradually increased. One-half teaspoonful of Pabulum was started on the one hundred and first day. On the seventy-third day a slight diarrhea was controlled by adding one tablespoonful of powdered protein milk to the formula for one day.

From a birth weight of 735 Gm the baby lost weight down to a low point of 595 Gm on the eighth day. On the tenth day the gradual rise in weight started and continued with no appreciable interruptions. The birth weight was regained on the twenty-fourth day and was doubled on the eighty-fourth day. At birth the baby could be easily held in the palm of one hand. Figure 3 shows her at 23 days of life. Progress was uneventful up to the eighth day, when she had a severe cyanotic attack followed by periods of apnea. Feedings were stopped for twenty-six hours and aromatic spirit of ammonia, caffeine with sodium benzoate and epinephrine and oxygen were used. The cyanotic attacks continued up to the twelfth day, when icterus developed. On the ninth day cyanosis and apnea continued and became more marked. Following one of the feedings, apnea suddenly set in and no heart tones were audible. The usual measures failing, epinephrine and caffeine were injected intracardially. There was an immediate response and she continued to go along as before. On the thirty-second day there was another series of attacks of cyanosis and apnea which were treated similarly with the addition of a mustard bath daily. Feedings were stopped for four hours. Beginning with the forty-fifth day, weight gain and general improvement continued at an increasing rate (fig 5). On the seventy-eighth day the patient became edematous and the urine showed 18 white blood cells per high power field. There was a marked pneumonia. The edema and urine cleared up in forty-eight hours. Aside from this there were no setbacks to the child's progress. At no time while in the hospital did she have an infection of the upper respiratory tract. The baby was kept in an oxygen bed for two months.

At 1 year of age the little girl weighed 17 pounds and 5 ounces (8 Kg) and was 28¼ inches (72 cm) tall. She is now 1 year and 9 months old and although small for her age is otherwise perfectly normal, both mentally and physically. Figure 4 shows the child at 1 year.

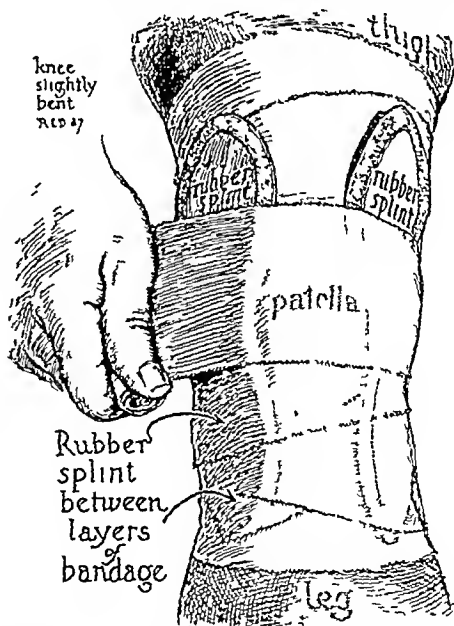
185 North Wabash Avenue

SIMPLIFIED SUPPORT FOR KNEE INJURIES

WALTER TRUSLOW M.D. BROOKLYN

A great engineer, viewing a splendid locomotive awaiting its start on a transcontinental trip said "You have no idea how simple is its mechanism. We have invented away the complications." For some of the noninfected derangements of the knee including sprains and many of the cartilage injuries, I have found the mere incorporation, in the Ace bandage, of two rather long ovoid pieces of sponge rubber, on either side of the patella, to be remarkably effective. For an adult, the three-inch bandage is used. One-fourth inch sponge rubber is selected. Two pieces are shaped, each about 8 inches long and 2½ inches wide, and with a small crescent (about one sixth of a circle) cut out to fit the sides of the patella. This sponge rubber will fit better if each piece is beveled about its entire periphery. This combination bandage is applied with the knee in about 10 to 15 degrees flexion. If the patient applies it himself, he can get best control by standing on the opposite foot and placing the foot of the injured limb on a low stool. A layer of the Ace bandage is first applied, with but little traction, from about 4½ inches below to about 4½ inches above the center of the patella. The two pieces of sponge rubber are then carefully placed on each side of and close to the patella and the Ace bandage continued until the rubber is entirely enclosed. The usual instruction of making moderate traction on each turn of the second layer of the bandage is given. The bandage is taken off once a day for washing the limb and for gentle passive motion and is immediately reapplied.

This method is applicable to simple sprain with or without swelling to many of the injuries of the cartilage, to injury of the crucial ligaments, and even to slight bone chipping, if there is evidence that the position of the fragment is good. It is useful in those cases of cartilage derangement in which, lacking a history of repeated injury, it is but fair to give the patient



Combination sponge rubber and Ace bandage partly applied to the left knee featuring the shape and position of the sponge rubber splints. To complete the support the bandage will be continued to the top edge of its inner layer. (Drawing by Dr. Robert L. Dickinson New York)

the benefit of conservative treatment, in cases of repeated injury but awaiting subsidence of swelling before operation, and in the cases in which operation is definitely indicated but refused. As a means of support it has the advantage of comparative lightness, of easy self care by an intelligent patient and of real effectiveness the more the knee bends and therefore the greater the hazard of slipping cartilage, the

more exact is the sponge rubber pressure at the points desired. Furthermore, it allows the patient to continue at his work, as a knee flexion to nearly a right angle is obtainable and this without buckling of the bandage so often seen when an unbraced bandage is used.

In modified form, this principle of support is applicable to injuries of other major joints, such for instance as the so called tennis elbow.

Medical Arts Building, 142 Joralemon Street

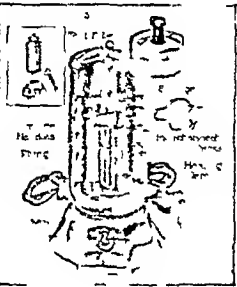
Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT
HOWARD A. CARTER, Secretary

GOMCO STERILIZER ACCEPTABLE

Manufacturer Gomco Surgical Manufacturing Corporation, 67 Ellicott Street, Buffalo

The Gomco Sterilizer is designed to utilize boiling water as a medium for sterilizing the needles and syringe used by the diabetic patient and for heating Benedict's solution and urine for home testing of the patient's own condition under the direction of the physician. Small and compact, approximately 6 inches high, the apparatus has a heavy, chrome-plated metal base to prevent tipping.



Gomco Sterilizer

An attachable cord and molded plug fit into the base. Embedded in the top of the base is a standard outlet which, in addition to being a receptacle for the boiler, enables the base to be used as a heating element. The water boiler itself is made of copper surrounded with an aluminum jacket. Between the copper wall and the aluminum jacket is wound the electric heating coil to heat the water in the container. This is spun to the aluminum jacket to make the unit water tight. It can be removed from the metal base for washing purposes when necessary. A brass rack, chrome plated, sits inside the boiler with apertures in the plate to hold a syringe up to 2 cc capacity with barrel and plunger separate, two hypodermic needles, and one test tube for a sample of urine. An interchangeable plate is supplied to hold four test tubes if it is desired to use the unit for boiling urine samples. Four glass test tubes, with a capacity of 5 cc each, are part of the equipment. The cover is made of spun copper, chrome plated, with steam vents and surmounted by a molded bakelite knob.

An investigator acceptable to the Council performed tests with the instrument to determine its efficiency as a sterilizing medium.

TEST 1—The first test was made to determine the length of time it took to raise the temperature of the water to boiling.

Results of First Test

Starting Temperature		Water Boiled in
Room	Water	
19.5 C	19.5 C	11 minutes
21.0	21.0	8 minutes
23	23	7 1/2 minutes
23.5	23.5	7 1/2 minutes
26	26	7 minutes
26.5	26.5	7 minutes
27	27	7 minutes
31	31	5 minutes

The boiler was filled with distilled water to the level of the upper ring or corrugation on the outside of the jacket. The conditions under which the tests were run were similar to those that would be met in practical use.

The Gomco apparatus boils water within a reasonable time

TEST 2—Three cc of broth culture of *Staphylococcus aureus*, *Bacillus coli*, *Bacillus subtilis* (spores present) and *Streptococcus haemolyticus*, respectively, were placed in test tubes similar in size to those furnished with the apparatus. With the water in the apparatus boiling, a set of tubes, held in the test tube rack,

Results of Second Test

Organisms	Minutes Exposure			
	2 1/2	5	10	15
<i>Staphylococcus aureus</i>	0	0	0	0
<i>Bacillus coli</i>	0	0	0	0
<i>Bacillus subtilis</i>	+	+	+	0
<i>Streptococcus haemolyticus</i>	0	0	0	0
+ means growth				
0 means no growth				

was immersed for two and one-half, five, ten and fifteen minute periods. A separate set of cultures was used for each period and with the water at about the level of the upper corrugation. After exposure the test cultures were inoculated into broth with capillary pipets and incubated seventy-two hours to test for sterility.

The results of the culture tests are as would be anticipated with boiling water.

TEST 3—(a) Glass syringes and needles were contaminated with a mixture of *Staphylococcus aureus*, *Bacillus coli* and *Bacillus subtilis* in broth and allowed to dry. These were placed in the syringe rack and immersed in the boiling water in the apparatus for two and one-half, five and ten minute periods, a separate set being used for each period. After exposure each instrument was placed in broth and incubated for seventy-two hours.

(b) Separate areas of the rim of the boiler at the seat line of the cover were contaminated with the organisms and allowed

Results of Third Test

	Controls	Minutes			
		2 1/2	5	10	15
Syringe <i>Staphylococcus aureus</i>	+	0	0	0	0
Plunger <i>S. aureus</i>	+	0	0	0	0
Needle <i>S. aureus</i>	+	0	0	0	0
Syringe <i>Bacillus coli</i>	+	0	0	0	0
Plunger <i>B. coli</i>	+	0	0	0	0
Needle <i>B. coli</i>	+	0	0	0	0
Syringe <i>Bacillus subtilis</i>	+	0	0	0	0
Plunger <i>B. subtilis</i>	+	0	0	0	0
Needle <i>B. subtilis</i>	+	+	0	0	0
Rim <i>Staphylococcus aureus</i>	+	0	0	0	0
Rim <i>B. coli</i>	+	0	0	0	0
Rim <i>B. subtilis</i>	+	0	0	0	0
Cover <i>S. aureus</i>	+	0	0	0	0
Cover <i>B. coli</i>	+	0	0	0	0
Cover <i>B. subtilis</i>	+	0	0	0	0

to dry. After operating the apparatus for the periods mentioned, each area was swabbed, broth inoculated and incubated seventy-two hours.

(c) The inside top of the cover was contaminated with a mixture of the organisms and similarly tested.

The experiments with the contamination of the rim and cover of the apparatus were performed to comprehend any possibility that if these areas were not sterilized they might contaminate the instruments during removal from the boiler.

The firm submitted an article to support the claim that the instrument is efficient in heating Benedict's solution for testing the urine of patients with diabetes. This gave an account of eighty-eight controlled cases in which both the aforementioned method and a conventional gas burner were used to boil the water. Results indicate that the two methods are equally effective for this purpose.

In view of the foregoing report the Council on Physical Therapy voted to include the Gomco Sterilizer in its list of accepted devices, since it appears to be a satisfactory apparatus and a convenient device for employing boiling water as a sterilizing medium.

Council on Foods

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED

FRANKLIN C BING Secretary

- (1) MRS FILBERT'S BRAND OLEOMARGARINE
- (2) SOUTHERN BELLE BRAND OLEO-MARGARINE
- (3) ECONOMY BRAND OLEOMARGARINE
- (4) NU-BLEND BRAND OLEOMARGARINE
- (5) SEA GULL BRAND OLEOMARGARINE
- (6) OUR BANQUET BRAND OLEOMARGARINE

Manufacturer—J H Filbert, Inc, Baltimore

Description—(1), (2) and (3) Domestic vegetable oleomargarine—prepared from hydrogenated cottonseed oil, winter white cottonseed oil, buttermilk, salt, 0.5 per cent derivative of glycerin and 0.1 per cent sodium benzoate

(4) Nut margarine—prepared from a mixture of hydrogenated cottonseed oil and/or hydrogenated soy bean oil, coconut oil, milk, salt, 0.5 per cent derivative of glycerin and 0.1 per cent sodium benzoate

(5) and (6) Animal fat oleomargarine—prepared from oleo oil, neutral lard, cottonseed oil, buttermilk, salt and 0.5 per cent derivative of glycerin

Manufacture—In the preparation of the animal oleomargarine, oleo oil and neutral lard are melted and cottonseed oil is added. The mixture is emulsified with added cultured skimmed milk and the emulsion is fired on a surface of cold water and kneaded to remove excess moisture. Batches of the emulsion are blended and the salt, derivative of glycerin, cultured skimmed milk (if needed) and sodium benzoate are added. The product is churned until the proper consistency is obtained, refrigerated, cut into prints and automatically wrapped and sealed.

The procedure followed for the domestic vegetable oleomargarine and nut margarine is essentially the same as described, except that the ingredients are liquid, and melting is not necessary.

Analysis (submitted by manufacturer) —

	Vegetable Oleomar- garine, per Cent	Nut Oleo margarine per Cent	Animal Fat Oleo- margarine per Cent
Moisture	15.8	16.0	14.9
Total solids	84.2	84.0	85.1
Ash	2.1	2.1	2.1
Fat (ether extract)	80.5	80.3	81.3
Protein (N×6.25)	1.3	1.3	1.5
Carbohydrates (by differ- ence)	0.3	0.3	0.2
Dextrose	trace	trace	trace
Sucrose	0.0	0.0	0.0
Derivative of glycerin	0.2	0.2	0.2

Calories—(1), (2) and (3) 73 per gram, 207 per ounce

(4) 73 per gram, 207 per ounce

(5) and (6) 74 per gram, 210 per ounce

ARTISANA WELL WATER

Manufacturer—Artisana Water Company, Phoenix, Ariz

Description—Bottled artesian well water of low mineral content, practically free of micro organisms

Manufacture—Water issuing at a constant temperature of 23 C from an artesian well 392 feet deep encased its entire length with standard screw type steel casing is pumped through a closed system into hydropneumatic tanks and delivered through copper pipe to the adjacent bottling plant, where it is filled into clean 5 gallon glass bottles. The cork and bottle neck are covered with a dust-proof paper cap. All water so bottled is delivered within twenty-four hours. The bottles are washed in a cleansing solution containing trisodium phosphate, scalded, rinsed in hot Artisana water, sterilized in a sodium hypochlorite

solution for two minutes, and rinsed twice in cold Artisana water. Corks are sterilized in a similar way.

Sanitary Analysis (submitted by manufacturer)—Sediment none, turbidity none, odor none, color none. *Parts per million*: Total solids 180.0, nitrogen as free ammonia 0.000, total organic nitrogen 0.28, nitrites 0.000, nitrates 5.000, oxygen consumed 0.000, total chlorine 41.7, hardness (soap method) 42.0.

Chemical Analysis (submitted by manufacturer)—*Parts per million*: total soluble salts 403, sodium (Na) 32, calcium (Ca) 37, magnesium (Mg) 34, chlorides 72, sulfates 40, carbonates 2, bicarbonates 188, fluorine (F) 0.3 pH 7.8.

Micro Organisms (data submitted by manufacturer)—Bacteria per cubic centimeter at 20 C 7, at 37 C 15. B. coli in 50 cc none.

CRYSTAL FLAKE BRAND CRYSTAL WHITE SYRUP

Manufacturer—American Syrup and Sorghum Company, St Louis

Description—A table syrup, corn syrup sweetened with granulated sugar, flavored with vanilla.

Manufacture—The corn syrup is heated to 125 F and mixed with the sugar, water and vanilla. The mixture is brought to a temperature of 180 and immediately sealed in tins.

Analysis (submitted by manufacturer)—Moisture 25.1%, total solids 74.9%, ash 0.23%, protein (N×6.25) 0.1%, reducing sugars before inversion 31.3%, reducing sugars after inversion 36.3%, sucrose 4.9%, carbohydrates 74.6%.

Calories—3 per gram, 85 per ounce

GOLDEN GATE BRAND EGG NOODLES

Manufacturer—Golden Gate Macaroni Company, Inc, San Francisco

Description—Noodles prepared from flour, dried egg yolk and water.

Manufacture—Macaroni flour, dried egg yolks and water, in definite proportion, are mechanically mixed and kneaded. The resulting dough is rolled by machine to required thinness, cut, dried on racks under controlled conditions, and packed in cartons.

Analysis (submitted by manufacturer)—Moisture 11.2%, total solids 88.8%, ash 0.6%, fat (ether extract) 3.2%, protein (N×5.7) 17.6%, reducing sugars as dextrose 0.6%, sucrose 1.5%, crude fiber 0.3%, carbohydrates other than crude fiber (by difference) 67.1%, phosphoric acid (P O₅) due to lipids 0.12%, total phosphoric acid (P O₅) 0.37%.

Calories—37 per gram, 105 per ounce

LIQUID SUNSHINE BRAND HAWAIIAN PINEAPPLE JUICE

PONO BRAND HAWAIIAN PINEAPPLE JUICE DRINK ME" WONDERLAND BRAND PINEAPPLE JUICE

HASEROT'S FANCY BRAND HAWAIIAN PINEAPPLE JUICE

Manufacturer—Hawaiian Canneries Co, Ltd, Kapaa, Kauai, T H

Distributor—The Haserot Company, Cleveland

Description—Canned Hawaiian pineapple juice retaining in high degree the natural vitamin content.

Manufacture—Juice drained from crushed fruit or extracted from whole fruit is "flash" processed, canned and sealed.

Analysis (submitted by manufacturer)—Moisture 82.5%, total solids 17.5%, ash 0.4%, fat (ether extract) 0.03%, protein (N×6.25) 0.5%, crude fiber 0.01%, titratable acidity as citric acid 0.7%, carbohydrates other than crude fiber (by difference) 15.86%, reducing sugars as invert sugars 15.6%.

Calories—0.64 per gram, 18 per ounce, 19 per fluidounce

Vitamins—A good source of vitamins B and C and contains vitamin A.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JANUARY 22, 1938

ENDOCRINE THERAPY OF CRYPTORCHIDISM

The factors involved in the normal descent of the testis have not been completely elucidated. It still remains somewhat of a biologic mystery. Certainly Haller's suggestion that it is caused by the increase in the weight of the organ is not plausible. The theory of traction by the gubernaculum testis, though more likely, is inadequate because the gubernaculum is principally a fibrous structure with only a few poorly developed muscle fibers. Furthermore, the testes are found in the scrotum at a time when muscle fibers cannot be demonstrated in the gubernaculum. There is ample evidence that endocrine influences play an important part in the growth of the testis and other sex organs, as well as in the descent of the testis into the scrotum.

At least three factors appear to be responsible for the normal descent of the testis: the increase in the size and weight of the organ, the mechanical directive force of the funnel-shaped, musculofascial inguinal canal, and a tractor or at least guiding influence of the gubernaculum. The endocrine origin of cryptorchidism is suggested by the fact that in more than one half of the cases general endocrine insufficiency is associated particularly in cases of bilateral cryptorchidism. One need not, on the other hand, assume this to be the case in unilateral maldescent. The testis here may be for a time entirely normal. In operating in such cases, surgeons find anatomic reasons for retention of the organ in the shortness of the structures to which the testicle and the cord are attached, as well as in the maldevelopment of the peritoneal process, the transversalis fascia, the cremaster muscle and the intercolumnar fascia.

Cryptorchidism calls for correction before the advent of puberty. The retained testis is certain to undergo atrophy, to lose its spermatogenic function and to favor the formation of a hernia, adhesions, hydrocele and torsion of the cord, and to exhibit a greatly increased tendency to malignant degeneration. The psychic effect on the youthful patient of the existence of an abnormality should not be overlooked.

The inadequacy of surgical treatment of cryptorchidism may be surmised from the report of a large series of cases by Burdick and Coley.¹ In an analysis of 537 orchidopexies these authors found that satisfactory results as to the location of the testis were obtained in about 50 per cent. As regards the size of the testicle, satisfactory results were obtained in about 15 per cent. In their experience an atrophic testis, when placed in the scrotum, does not resume a normal development.

The endocrine therapy of cryptorchidism received its impetus from the discovery by Aschheim and Zondek² in 1928 of a gonadotropic principle in the urine of pregnancy. In 1930 Schapiro³ reported remarkable results obtained with this material in cases of cryptorchidism and hypogenitalism in boys and young adults. He does not give the percentage rate of successful cures of cryptorchidism but emphasizes the striking effect on the growth of the testis, the penis and the scrotum. There exists much corroborative evidence of the hormonal influence on the growth and the descent of the testis in animal experiments. Engle,⁴ Engle and Smith, Moore, De Jongh, Bourg, Deming and others have demonstrated conclusively the gonadokmetic effect of the anterior pituitary and of the so called anterior pituitary-like substance derived from pregnancy urine. The effect is directly on the interstitial cell mass of the testis with a resultant development of the genital tract and of the accessory sex apparatus. Smith and Engle point out that the animals reacted to the urinary extract to a greater degree than to fresh pituitary transplants. It is probable, therefore, that the urinary principle is not of hypophysial origin. All the foregoing authors emphasize that the gametogenic activity of the testis is not stimulated by this substance. Engle⁴ injected immature male macacus monkeys with the extract of pregnancy urine and noted a perceptible increase in the size of the testis on the tenth to the fourteenth day, together with increased mobility of the organ. He emphasizes particularly the striking changes in the size and shape of the scrotum, which rapidly attained the proportions seen in a mature male. At the same time the testis moved its position from the head of the inguinal canal into the scrotum. Engle concludes that the normal size of the testis is due to hormone action and that such stimulation is at least the inciting factor in the normal descent of the testis. He therefore questions the validity of operative procedures in scrotal placement of undescended prepubertal testes except for cosmetic reasons.

1 Burdick C G and Coley B I. Abnormal Descent of the Testicle. *Ann Surg* 84: 867 (Dec) 1926.
2 Aschheim Selmar and Zondek Bernhard. De Schwangerschaftsdiagnose aus dem Harn durch Nachweis des Hypophysenhormons. *Klin Wchnschr* 7: 1404 (July 22) 1927.
3 Schapiro B. Kann man mit Hypophysenhormonen die mangelentwickelten männlichen Genitalapparate beim Menschen wieder anregen? *Deutsche med Wchnschr* 56: 1695 (Sept 19) 1931.
4 Engle E T. Experimentally Induced Descent of the Testis in the Macacus Monkey by Hormones from the Anterior Pituitary of the Pregnancy Urine. *Endocrinology* 10: 513 (Sept Oct) 1937.

Thompson, Bevan, Heckel, McCarthy and Thompson⁵ present a summary of the clinical results obtained with gonadotropic therapy. Of the 148 cases of undescended testes in 103 patients collected from the literature, the condition was bilateral in forty-five and unilateral in fifty-eight. Descent as the result of treatment occurred in 106, or 72 per cent, in their own material; descent occurred in only four of the twenty-one undescended testes in eighteen patients. These authors conclude that, while the number of instances in which descent occurred was small, the increase in size and vascularity of the genital organs makes the subsequent operative procedures less difficult. They suggest that all patients should be treated from four to six months with the gonadotropic substance and that operative procedures be carried out in those cases in which the descent fails to occur. These authors also call attention to the possibility of inducing changes which simulate premature puberty in the younger boys although they have not noted any injurious effect. In an analysis of eighty-one cases, including twenty of his own, Cramer⁶ finds that a complete result (scrotal placement) was obtained in fifty-eight. The method he found is not only conducive to scrotal position but also presents the additional advantage of correcting hypogonadism when it is present. Furthermore, in nearly every case in which a result was obtained, an increase was shown in the size of the testis, the penis and the scrotum. Often the testis that descended was at first small and when examined later was found to have doubled its original size. Scrotal pouches that were originally shallow, with two or three folds, were increased in depth and in the number of folds. Unilateral cryptorchidism often showed an increase in the size of the testis on the normal side.

In evaluating the results of endocrine therapy one should not lose sight of the possibility of spontaneous descent, which may take place at any time from birth to puberty. Thus, Drake⁷ reported thirty-five cases of undescended testes in boys, twenty-three of which showed a spontaneous descent mostly at puberty. Hamilton and Hubert⁸ state that, of the sixteen patients referred to them by pediatricians, only six were true cryptorchids. The other ten were cases of spastic retention (pseudocryptorchids). These authors suggest that a high number of cases of spontaneous descent may be explained by the fact that the cases reported were those of physiologic intermittent retention rather than of true cryptorchidism. They propose a test for differentiation of the two conditions which consists in applying a hot water bag to the scrotum, the inguinal

region and the perineum for thirty minutes in order to relax the muscular spasm that causes retraction of the testicle.

According to Deming,⁹ undescended testes can be made to occupy the scrotum in approximately 45 to 50 per cent of cases by gonadotropic therapy. He suggests that gonadotropic treatment be commenced between the second and third years, from 40 to 100 rat units may be given to such children on alternate days for a period of one month. If the testis does not descend, Deming would repeat the treatment in two months. Testes that respond to this treatment do so as a rule during the first series of injections, and if the second series is unsuccessful further endocrine treatment will probably be ineffective. Descent of the testes in persons past puberty probably cannot be expected by endocrine therapy.

Sufficient clinical evidence is at hand to indicate that endocrine therapy alone is capable of bringing about the descent of a cryptorchid testis in about 50 per cent of all cases. It is useful in identifying those testes which cannot be expected to descend at puberty and which, therefore, should be operated on at an earlier age. When operative procedures for the condition become necessary, the preliminary gonadotropic therapy facilitates surgery by elongating cord elements, and, lastly, the postoperative results are greatly improved by the endocrine treatment.

PELLAGRA AND NICOTINIC ACID

After the discovery of the effectiveness of nicotinic acid and its amide in the treatment of blacktongue in dogs had been described, it was prophesied editorially¹ that the usefulness of these compounds in the treatment of pellagra soon would be investigated. Although the publication of Elvehjem and his collaborators occurred in September, a time of the year when the incidence of pellagra is on the wane, commercial nicotinic acid has been tested already on a number of pellagrins in at least three widely separated localities. There now have appeared reports from Durham, N. C., Cincinnati and Indianapolis. These reports agree in ascribing a prompt curative effect to nicotinic acid.

The Cincinnati investigators² gave the drug to four pellagrins who exhibited characteristic dermatitis, glossitis and stomatitis. Within twelve hours after the intravenous administration of nicotinic acid, these observers found signs of healing of the oral lesions of each subject. The healing of these lesions was complete within seventy-two hours. Spies and his collaborators pointed out that occasionally pellagrins will

⁵ Thompson W. O., Bevan A. D., Heckel N. J., McCarthy E. R. and Thompson P. K. The Treatment of Undescended Testes with Anterior Pituitary-like Substance. *Endocrinology* 21: 220 (March) 1937.

⁶ Cramer, Arthur J. Jr. Evaluation of Hormone Therapy of Undescended Testes in Man. *Endocrinology* 21: 230 (March) 1937.

⁷ Drake C. B. Spontaneous Descent of the Testis. *J. A. M. A.* 102: 759 (March 10) 1934.

⁸ Hamilton J. B. and Hubert G. Differential Diagnosis of Pseudocryptorchidism and True Cryptorchidism. *Endocrinology* 21: 644 (Sept.) 1937.

⁹ Deming Clyde L. Hormonal and Surgical Bases for Treatment of Undescended Testis. *Am. J. Surg.* 38: 186 (Oct.) 1937.

¹ Relation of Nicotinic Acid to Human Pellagra. editorial. *J. A. M. A.* 109: 1203 (Oct. 9) 1937.

² Spies T. D., Cooper Clark and Blankenhorn M. A. Therapeutic Administration of Nicotinic Acid in Human Beings During Health and Disease. read before the Central Society for Clinical Research Nov. 5 1937 at Chicago.

show spontaneous remissions, but such patients have not been as severely ill nor have they shown relief as promptly as did the ones in their most recent study

The patient described by Smith and his collaborators³ at Duke University had endemic pellagra with anorexia, dermatitis, changes in the sebaceous glands and dementia. This patient made a dramatic recovery after the administration, which was usually parenteral, of nicotinic acid in doses of 60 mg (approximately 1 grain) daily for twelve days.

Fouts, Helmer, Lepkovsky and Jukes⁴ also have reported the effects of feeding nicotinic acid in pellagrins. The drug was administered orally in doses of from 0.5 to 1 Gm daily. All four patients observed showed distinct improvement in general condition and in mental attitude within two days of the onset of therapy. The stomatitis and dermatitis disappeared. The authors concluded that the improvement in these four patients with pellagra following the oral administration of nicotinic acid was as satisfactory as that following the oral administration of a filtrate prepared from an extract of liver, which they had used formerly, except for an increase of time required for the complete disappearance of the dermatitis.

It should be emphasized that all three groups of workers have reported undesirable reactions from taking nicotinic acid. The Indianapolis investigators stated that following the oral administration of nicotinic acid, in the dosages used by them, the patients noted sensations of heat and tingling of the skin. There was a distinct dilatation of peripheral blood vessels during this time, but the fall in blood pressure was only slight and temporary. The Durham investigators found that in doses of 60 mg there was no reaction following oral administration of the drug. After intramuscular or intravenous injection, however, a marked flushing of the skin was observed. Spies and his collaborators likewise observed flushing, itching and tingling of the face, trunk and extremities following the oral administration of therapeutic doses of nicotinic acid. The symptoms were not seen with less than 50 mg when given orally, and in one case 200 mg was required. The Cincinnati investigators tested nicotinic acid on nineteen persons before giving the drug to pellagrins.

It is evident that more information is necessary before the usefulness of nicotinic acid in the treatment of pellagra can be evaluated. The evidence so far seems promising. Future work undoubtedly will provide information regarding the chemical standards for the drug, its limitations when used orally or parenterally, and the value, if any, of related compounds.

³ Smith D T, Ruffing J M and Smith Susan G. Pellagra Successfully Treated with Nicotinic Acid. *J A M A* 105: 2034 (Dec 18) 1937.

⁴ Fouts P J, Helmer O M, Lepkovsky Samuel and Jukes T H. Treatment of Human Pellagra with Nicotinic Acid. *Proc. Soc. Exper. Biol. & Med.* 37: 403 (Nov) 1937.

⁵ Probably it will not be necessary to remind physicians of the exceedingly toxic nature of nicotine, a compound related to nicotinic acid when administered intravenously. Commercial preparations of nicotinic acid and its amide are now available.

Current Comment

NATIONAL DEPARTMENT OF HEALTH

The federal government expends between one and two hundred million dollars annually for the conservation and promotion of health, exclusive of the money expended for those purposes in the army and navy. Through the federal subsidy system it supervises and directs the expenditure of many millions of state money for health purposes. The magnitude of the expenditure, even when regarded simply as a business proposition, calls for the organization of a national Department of Health. The social, economic and military value to the country of the health and lives of its 127,000,000 inhabitants makes the creation of such a department imperative. Elsewhere in this issue appears an analysis of the problem.¹ It defines an executive department, tells why a unified Department of Health can render more efficient service for the health of the people than can many minor units, and explains the weakness of the plan now before Congress for the creation, not of a Department of Health, but of a Department of Welfare. The interests and loyalties of the secretary at the head of a welfare department must necessarily, by reason of his education, training and experience, be biased in favor of educational activities or of welfare activities or else divided among the three fields with which the department is concerned. Every reader of *THE JOURNAL* who is interested in public affairs should read this article. Then, if you are convinced that a national Department of Health should be established, write to your Senators and your Representative expressing your views. The Board of Trustees of the American Medical Association and the House of Delegates of the Association have already expressed their approval of this movement.

WHY DRUGGISTS PRESCRIBE

The best pharmacists do not prescribe for their patients. Physicians have maintained that the best interests of the patient demand that prescribing be done by medically trained persons only, the ethical pharmacist should limit himself to compounding and purveying. If any one believes seriously that counter prescribing is not a standard trade practice in drug stores, attention should be called to an article in the November 1937 issue of the *American Druggist* under the title "A Billion Dollar Sneeze."¹ This article presents many correct, pertinent and useful facts about colds, their infectiousness, the relation of metabolism and exposure to their occurrence, their cost, and what science knows about their prevention. Then, tucked away at the end, next to advertisements of *Adex* Tablets and Smith Brothers' Cough Drops, are five steps to cold prevention by means of which the druggist is assured "your preventive products will increase." The first step is vitamins "Science 1"

¹ Why a United States Department of Health this issue.
² A Billion Dollar Sneeze. *Am. Druggist*, November 1937.

seems, has proved "that the vitamin A and D content of these [fish liver] oils helps in the treatment of colds, the laity terminology being that they help build up the resistance" The Council on Pharmacy and Chemistry does not allow such claims, but the council is not a sales organization The second step is a laxative¹ "The laxative treatment you recommend can be a 10c item or a \$1.25 sale" The third step has to do with sales possibilities in nose drops, jellies, sprays and inhalants, and the fourth step cashes in on "any one of a number of mouth washes and gargles" In the fifth step the customer gets over on the alkaline side with milk of magnesia, antacid powders and tablets And the climax

Clerks should be taught the practical advantage of solicitous inquiries about the customer's symptoms Muscular pains, sore throat, headache, clogged nasal passages, chills, chest pains, and coughs each may be the basis for the sale of a product over and above what the customer came in to buy get your share of this billion dollar business and you will make money out of sneezes and sniffles in 1937-38 Ah choo

So pharmacy *à la* the *American Druggist* is a science and a profession The science is salesmanship—but the profession is the practice of medicine And for practicing medicine the druggist needs a license in medicine

GRADUATE MEDICAL EDUCATION

Elsewhere in this issue¹ appears the first of a series of articles developed through the Council on Medical Education and Hospitals, discussing graduate medical education as carried out in various parts of the United States under the auspices of state medical societies In many instances the state universities and state health departments cooperated As will be observed from this series of articles, this effort, carried on as a voluntary work, achieves a high degree of success, perhaps in some instances beyond what might be achieved by almost any other method Certainly it will be well for physicians in various places to inform themselves concerning these matters, since each of the states may learn from others ideas of advantage and new methods that may not have been given consideration

THE TOXICITY OF ORGANIC SILICATES

Organic compounds of silicon are employed industrially at present chiefly as solvents, components of paint and preservatives of stone The toxic properties of one such organic compound, ethyl silicate (tetraethyl-ortho-silicate), have recently been studied by Kasper, McCord and Fredrick¹ When this substance was administered to 228 small animals (rabbits, guinea pigs and rats) at various intervals by the intravenous, intraperitoneal, subcutaneous, intratracheal or oral route it was found highly injurious The minimal lethal dose for rats when introduced intraperitoneally was approximately 0.6 cc per kilogram of body weight and with rare exceptions death took place within four days The chief initial action of ethyl silicate is centered in

the pulmonary tract, regardless of the method of introduction Rupture of the terminal capillaries is accompanied by pulmonary hemorrhage, often in association with anemia, hematuria or secondary pneumonia Pulmonary hemorrhage may be demonstrated within ten minutes after intraperitoneal injection, but other than trivial reaction in the peritoneal cavity is lacking In animals surviving the effects of the primary action of ethyl silicate, acute nephritis may be demonstrated As far as animal experiments can demonstrate, ethyl silicate possesses no properties similar to the slow action of silica in producing silicosis, but it does display a high degree of toxicity, acute in nature and possibly, but not yet so demonstrated, related to the slow action of silica

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

CALIFORNIA

Fatal Case of Botulism—A fatal case of botulism was recorded in Los Angeles County in a woman who opened a jar of home canned corn, tasted it without swallowing any and threw the contents to the chickens Ten chickens died the same day and five the next day, all having symptoms of lumber neck The woman became sick October 5, within thirty hours after tasting the corn, and died October 12, according to the *Weekly Bulletin* of the state department of public health

Society News—The Alameda County Medical Association was addressed December 20 by Drs Frank R Makinson on "Management of Benign Tumors of the Breast" Sumner Everingham, "Biopsy in Breast Tumors", John L Lohse, "Principles Involved in the Treatment of Breast Carcinoma," and William H Sargent, "X-Ray Therapy in Mammary Carcinoma" All are of Oakland—At a meeting of the San Francisco County Medical Society, January 11, Dr Edgar L Gilcreest gave a paper entitled "Dr Hugo Huger Toland, Great Pioneer Surgeon and Founder of the Medical School of the University of California", Dr Abraham Bernstein, "The Talmud, a Medical Laboratory," and Chauncey D Leake, Ph D, "Medical Journalism in California"—Dr Willis C Campbell, Memphis, addressed the Los Angeles Surgical Society January 14 on "Ununited Fractures of the Neck of the Femur"—The Los Angeles Cancer Society was addressed January 3 by Dr Max Cutler, Chicago, on "Present Trends in Radiation Treatment of Cancer"

COLORADO

Violation of Medical Practice Act—Earl Lukehart was fined \$50 and costs in justice court in Montrose, November 9 for violation of the state medical practice act Earlier Lukehart had been engaged by a physician of Montrose as a laboratory and x-ray technician but was dismissed for incompetence It was later found that he was treating patients himself and soliciting cases for treatment Lukehart is not a graduate in medicine

Marihuana in Colorado—Recently in the campaign carried on by the state board of health between twenty-five and thirty convictions were obtained against persons who were found to be growing cannabis Raids were conducted and a large amount of growing cannabis was seized and destroyed A report from the state health officer, Dr Roy L Cleere, Denver, points out that while the weed grows readily in Colorado, having been found in practically all sections of the state, in no instance in the past season was it found being cultivated by a white person In every instance except one the offenders were Spanish Americans All the cannabis found was growing for illicit purposes The Colorado law provides that cultivators of the weed must obtain a license from the board of health The only application ever made, which was for experimental purposes was not granted Previous to the enactment

¹ Graduate Medical Education I Iowa this issue p 40B
¹ Kasper J A McCord C P and Fredrick W G The Toxicity of Organic Silicon Compounds Detroit Department of Health

Oct 1, 1937, of the federal law governing cannabis, Colorado had no control over the possession, sale or traffic of the seed of the plant. An inadequate penalty also added to the difficulty of enforcing the state law, Dr Cleere said. The new federal law provides for a penalty of imprisonment not to exceed five years in the penitentiary and/or a fine not to exceed \$3,000.

DISTRICT OF COLUMBIA

Society News—Dr Isaac A Bigger, Richmond, Va., addressed the Washington Academy of Surgery December 10 on "Surgery of the Heart and Pericardium"—At a meeting of the Washington Ophthalmological Society, January 3, the speakers included Mr T E Oberg, New York, on "Practical Aspects of the Fitting of Contact Lens, with Demonstration of Technic both from the Lens Trial Case and with Dentacol Impressions."

Public Health Forum—Georgetown University has arranged a public health forum to disseminate specific non-technical information to the people of Washington. Dr George C Ruhland, health officer of the District of Columbia, opened the forum January 20 with a lecture entitled "Your Doctor and the Present Health Situation in Washington." Subsequent speakers will be

Mr Drane Lester, Federal Bureau of Investigation January 27 Your Doctor and Crime
Dr Ella Oppenheimer, director child and maternal welfare February 3 Your Doctor and Maternal Welfare
Dr Morris Fishbein, Chicago Editor of THE JOURNAL February 10 Your Doctor and State Medicine
Dr Thomas V Moore, professor of psychology Catholic University February 17 Your Doctor and Keeping Sane
Dr Raymond A Vonderlehr, U S Public Health Service February 24 Your Doctor and the Venereal Diseases
Dr William Charles White, past president district tuberculosis association March 3 Your Doctor and the Prevention of Tuberculosis
Dr James W Esler, professor of clinical cardiology Georgetown University March 10 Your Doctor Finds Work for Cardiac Patients

An additional feature of the forum will be a question box through which any one in the audience may submit questions to the lecturer, which will be answered at the next forum meeting.

GEORGIA

Personal—Dr Paul R Ensign, formerly of Butte, Mont., has been appointed pediatrician to a child health demonstration in Hancock-Glascock counties.—Dr Charles F Engelking has been reappointed health commissioner of Dalton and Whitfield County, it is reported.

Graduate Medical Assembly—The Atlanta Graduate Medical Assembly will be held at the Biltmore Hotel, Atlanta, January 25-28 with a program made up of clinics, motion pictures, demonstrations, lectures and round table discussions. The speakers will include

Drs Ralph H Major, Kansas City, Mo. Marion A Blankenhorn, Cincinnati, and Hugo Roesler, Philadelphia, Medicine
Drs Allen O Whipple, New York, and John J Morton, Rochester, N Y, Surgery
Dr Sherwood Moore, St Louis, Roentgenology
Dr Albert Graeme Mitchell, Cincinnati, Pediatrics
Dr Arthur J Bedell, Albany, N Y, Ophthalmology
Dr Harry R Stick Jr, Baltimore, Otolaryngology
Dr William C Sandy, Harrisburg, Pa, Psychiatry

ILLINOIS

Campaign Against Illegal Practitioners—The state department of registration and education announces the disposition of the following cases in its drive against illegal practitioners in Illinois

Louis V Vlasek, 3600 West Twenty-Sixth Street, Chicago, pleaded guilty November 12, placed on six months probation and fined \$20 for court costs. He promised he would stop practice.

James A Craig Robbins, pleaded guilty November 15 and was fined \$100 and costs.

O C Moe, 3442 Fullerton Avenue, Chicago, pleaded guilty November 23 and was fined \$100 and costs.

Outbreak of Communicable Diseases—Measles—Smallpox—A major epidemic wave of measles appears to be impending in Illinois, a release from the state department of health announced January 14. Cases recorded rose 100 per cent the week of the report. About 400 cases a day were being reported. During the twenty-four hours ended 8 a m January 15, eighty-two new cases of measles were reported to the Chicago Board of Health, bringing the number of cases this year to 1,570. The total reported in 1937 was 5,904. During December 293 homes were placed under quarantine in Waukegan, eighty-eight homes in Wood River were in quarantine January 6 and thirty-two in Pontiac during the month ended January 5. The schools were closed in Du Quoin when 400 and 500 cases were reported and schools were also closed

at Stonefort and Muddy. There were 297 cases in Bloomington, January 10.—Thirty cases of smallpox were reported in seventeen families in Nameoki, January 5, and one case in Waukegan, January 11.

CHICAGO

Public Lecture by Dr Irons—Dr Ernest E Irons, clinical professor of medicine and formerly dean, Rush Medical College, will deliver a public lecture at the Goodman Theater, January 23, under the auspices of the Chicago Medical Society. His subject will be "The Problem of Arthritis and Its Causes."

Personal—Dr Henry W Gentles, director of the first aid service of the Chicago chapter, American Red Cross, was guest of honor at a testimonial dinner, December 14. The occasion was the retirement of Dr Gentles after forty five years of service with the Red Cross, in the future he will act as the chapter's first aid consultant. He has been in charge of the Chicago chapter's first aid service since its organization and was the founder of the uniformed volunteer first aid corps.—Samuel M Gordon, Ph D, secretary of the council on dental therapeutics of the American Dental Association resigned November 30 to become vice president in charge of research with Endo Products, Inc, New York.

INDIANA

Personal—Dr Fred A Dennis, Crawfordsville, has been appointed health officer of Montgomery County, succeeding Dr James S Noblitt, Waveland.—Dr Charles L Wise, Camden, has been appointed health officer of Carroll County, succeeding Dr Albert C Clauser, Delphi.—Dr Carl M Porter, Jasonville, has been appointed health officer of Greene County, effective January 1.—Dr Ira E Perry, North Manchester, has been appointed health officer of Wabash County, succeeding Dr Arthur J Steffen, Wabash.

Society News—Dr William S Ehrlich, Evansville, addressed the Gibson County Medical Society in Princeton, December 13 on "Urinary Infections"—At a meeting of the Vigo County Medical Society in Terre Haute, December 14, Dr Leon L Blum, Terre Haute, spoke on "The Anemias: Classification, Diagnosis and Principles of Treatment"—Dr Thomas Parran, surgeon general, U S Public Health Service, Washington, D C, addressed a joint meeting of the Indianapolis Medical Society and the Indianapolis Council of Social Agencies, January 4, on "Syphilis Control."

New Drivers' License Law—An automobile drivers license law became effective in Indiana January 1. Under its provisions licenses will not be issued to drivers of school busses, motor bus drivers and taxicab operators without a medical report from a licensed physician. According to the state medical journal, this is a new feature of the drivers license procedure in Indiana, although several motor bus companies had required physical examinations of their drivers as a company regulation. The requirements to pass a beginners test for license include an examination of the eyes. Applicants are also required to state their physical condition on application forms. Should the applicants fail to pass the eye test they are rejected with the examiners' recommendation to consult an optical expert. If the examiners doubt that applicants are in sufficiently sound physical condition, a physician's report may be required before a license is issued.

LOUISIANA

Security Law Forces State Hospitalization Program—The state of Louisiana has undertaken a program to expand and improve its hospital facilities, which have been found inadequate for the practical application of the federal social security act, it is reported. The program includes a \$12,000,000 rehabilitation of Charity Hospital, New Orleans, providing it with accommodations for 3,000 patients and facilities for training the medical students of Louisiana State University. Tulane University and the dental students of Loyola University. To relieve the load at the Shreveport hospital in the extreme northwestern part of the state, with facilities for 800 beds, a 240 bed hospital is planned at Monroe in the northeastern section. It is expected that a site will be chosen on state owned property and that about \$235,000 will be spent in building and equipment. A 240 bed hospital is to be built in the central section at Alexandria on a state owned site already chosen, it will cost about \$235,000. The hospital in southwestern Louisiana at Lafayette is being enlarged to a capacity of 240 beds. Construction work costing about \$200,000 is expected to be completed next fall. These five hospitals was stated will be adequate to serve the needs of the people of the state, numbering about 1,000,000, all of whom are

receiving cash assistance through the federal social security act and the companion state law in Louisiana. The hospital program is financed through a two year appropriation of \$650,000 by the legislature and by one eighth of the receipts of the so called luxury tax. In establishing the hospital program, Gov. Richard W. Leche and State Welfare Commissioner A. R. Johnson obtained the counsel of physicians throughout the state. Regulations issued by the board require that only those patients will be admitted to hospitals "for whom there is on file a written statement by a competent physician stating that the condition of the patient is such that immediate hospitalization is required." Venereal disease control clinics are being set up throughout the state to care for those of its wards who are infected, and eight automobile trailers, equipped as traveling dental clinics, one for each congressional district, travel from one rural center to another under a definite schedule, giving treatment only to state wards.

MASSACHUSETTS

Dowling Surgical Building Dedicated—The new Dr. John J. Dowling Surgical Operating and Ward Building at the Boston City Hospital, named in honor of the late superintendent, was dedicated December 20. Mayor Mansfield and Dr. David D. Scannell were the principal speakers. A bronze tablet, the gift of the hospital employees, was presented by John Kelleher, head of the employees' committee, and accepted by Dr. Martin J. English on behalf of the board of trustees. According to the *New England Journal of Medicine*, December 30, the majority of the wards in the new building are now occupied and the operating rooms were to be opened in a few weeks. The ten story structure cost about \$1,300,000 and has accommodations for 300 patients. It has been under construction for about two and one-half years and was financed in part by a PWA grant.

MICHIGAN

Medical Coordinator for Genesee County—Dr. Leighton O. Shantz, Flint, has been appointed medical coordinator of Genesee County. Working through the probate court, Dr. Shantz will check on the medical necessity of those applying under the afflicted children's act and will follow cases committed by the court through the period of hospitalization in any hospital in the county. Dr. Shantz graduated at the University of Michigan Medical School, Ann Arbor.

Society News—Dr. Florian E. Schmidt, Chicago, discussed "Management of Pneumonia" before the Genesee County Medical Society January 6.—Dr. Grover C. Penberthy, Detroit, was reelected president of the Michigan Society for Mental Hygiene at its annual meeting in Detroit December 14.—The Wayne County Medical Society was addressed January 17 by Dr. Karen Horney, New York, on "Which Factors in Childhood Are Responsible for Later Neuroses?"—Dr. Don C. Sutton, Chicago, addressed the medical section January 10 on "Diagnosis of Continued Fever," and Dr. Ralph K. Ghormley, Rochester, Minn., will speak before the surgical section, January 24, on "Some Phases of Surgery of the Hip Joint."—Charles-Edward A. Winslow, Dr. P. H., New Haven, Conn., gave a public lecture entitled "Nursing the Community" at the Art Institute, Detroit, January 13.—Dr. Abraham H. Aaron, Buffalo, N. Y., discussed "Treatment of Common Gastro-Intestinal Conditions" before the Maumondes Medical Society, Detroit, January 11.—Dr. Vilray P. Blair, St. Louis, discussed "Injuries and Deformities of the Face" before the Oakland County Medical Society in Pontiac January 5.—Dr. Leon M. Bogart, Flint, addressed a recent meeting of the Gratiot-Isabella-Clare Medical Society on "Symptoms Simulating an Acute Abdomen."

MINNESOTA

Medical Seminar—The Center for Continuation Study of the University of Minnesota, Minneapolis, offered a seminar for medical graduates on ophthalmology and otolaryngology January 17-22. Members of the departments of ophthalmology and otolaryngology of the university medical school, Minneapolis, the Mayo Clinic, Rochester, and the general extension division conducted the course, which consisted of clinics, round table discussions and lectures illustrated by lantern slides, charts or patients. A feature of the session was a joint dinner meeting with the Minnesota Academy of Ophthalmology and Otolaryngology with Drs. John P. Macne, New York, and Thomas C. Galloway, Evanston, Ill., as the speakers.

Society News—Dr. John F. Fulton, New Haven, Conn., addressed the Hennepin County Medical Society, Minneapolis, December 22 on "The History of the Lymphatics and the Capil-

laries."—Dr. Thomas J. Dry, Rochester, discussed "Congenital Heart Disease" before the Minnesota Pathological Society, Minneapolis, January 18.—At a recent meeting of the East Central Minnesota Society in Cambridge, Dr. Alfred W. Adson, Rochester, discussed the surgical treatment of hypertension and A. P. Dunnigan of the state board of health demonstrated the Neufeld method of typing in pneumonia.—The Kandiyoht-Swift-Meeker County Medical Society was addressed in Willmar, December 8, by Dr. James K. Anderson, Minneapolis, on "Office Treatment and Diagnosis of the Common Rectal Diseases."—A symposium on medical economics was presented before the Red River Valley Medical Society in Crookston, December 14, by Drs. James L. McLeod, Grand Rapids, Berton J. Branton, Willmar, and Willard L. Burnap, Fergus Falls.

MISSOURI

The Hodgen Lecture—Dr. Allen O. Whipple, professor of surgery, Columbia University College of Physicians and Surgeons, New York, delivered the annual Hodgen Lecture January 11, under the auspices of the St. Louis Surgical Society and the Medical Fund Society. His subject was "Present Day Problems in the Therapy of Splenopathies."

NEW JERSEY

New Division in Health Department—A division of preventable diseases was created in the state department of health at Trenton in December, to be financed by social security funds. Until a director is appointed, the division will be supervised by the division of local health administration.

Society News—Dr. Raymond A. Vonderlehr, assistant surgeon general, U. S. Public Health Service, Washington, D. C., addressed the Camden County Medical Society, Camden, January 4, on "The Newer Phases in the Control of Syphilis."—Dr. Donald M. Pillsbury, Philadelphia, addressed the Bergen County Medical Society, Hackensack, January 11, on "Modern Treatment of Syphilis."—Dr. Russell L. Cecil, New York, addressed the Atlantic County Medical Society, Atlantic City, January 14, on chronic arthritis.

Pneumonia Control Program—The Essex County Medical Society and health departments in the county are cooperating in a pneumonia control program, according to the society's December bulletin. The health department of Newark has agreed to provide day and night facilities for typing specimens in its own laboratory and will accept typing done in other reputable laboratories. The department will if the physician desires provide a nurse or other person to collect specimens and will provide free serum for patients eligible for this assistance. Trained collaborators will be available on request to assist the physician to administer the serum. To assist in evaluation of the serum treatment, the department requests physicians to furnish it full clinical reports of the results obtained.

NEW YORK

Society News—Dr. David B. Jewett, Rochester, addressed the Ontario County Medical Society at Clifton Springs Sanatorium, January 11, on serum treatment of pneumonia.—Dr. Arthur C. Morgan, Philadelphia, addressed the Medical Society of the County of Orange in Newburgh December 14 on "Applied Therapeutics."—Dr. Frank H. Lahey, Boston, addressed the Chemung County Medical Society at its annual dinner in Elmira January 5 on "The Newer Clinical and Laboratory Developments in Thyroid Disease."—Dr. William V. Cone, Montreal, addressed the Franklin County Medical Society, Malone, December 1, on injuries of the head.—Dr. Wardner D. Aver, Syracuse, among others, addressed the Madison County Medical Society at its annual meeting, December 16, on "Spontaneous Intracranial Hemorrhage."—Dr. Russell L. Haden, Cleveland, addressed the Geneva Academy of Medicine recently on "The Clinical Problem of Nutritional Deficiency Disease."—Dr. Raphael Kurzrok, New York, addressed the Medical Society of the County of Westchester, White Plains, January 18, on "Endocrine Aspects of the Menopause."

New York City

Fourth Harvey Lecture—Dr. John P. Peters, professor of medicine, Yale University School of Medicine, New Haven, delivered the fourth Harvey Lecture of the current series at the New York Academy of Medicine January 20. His subject was "Transfers of Water and Solutes in the Body."

Course on Gastro-Enterology at Columbia—A course in gastro enterology arranged for practicing physicians who wish to review the subject and acquaint themselves with the recent advances in this field was opened January 6 at Bellevue

Hospital, fourth medical division, under the auspices of Columbia University College of Physicians and Surgeons. Twenty-five one hour sessions are scheduled, one each Thursday until June 23. The instructor is Dr Zachary Sagal. Applications and inquiries should be addressed to Dr Charles H Nammack, director, fourth medical division, Bellevue Hospital, Twenty-Third Street and East River, New York, N Y.

Hospital News—A \$1,500,000 nurses' home was formally opened at St Luke's Hospital, December 16. The building was financed by a bequest from Mrs Mary A Fitzgerald in memory of her father, for whom it is called the Eli White Memorial Building. It is fourteen stories high, with living quarters from the fourth to the tenth floors. The first floor contains offices, reception rooms and an auditorium, the second a dining room and the third classrooms and laboratories. It will accommodate 300 nurses.—Among speakers at the January meeting of the Polyclinic Medical Society of the New York Polyclinic Medical School and Hospital was Dr Elliott P Joslin, Boston, on "Present Problems in Diabetes".—The annual supper and dance of the Coney Island Hospital Alumni Association will be held February 26 at the St George Hotel roof garden.

OHIO

University Appointment—Dr Edward William Wallace, recently of the staff of the National Institute of Health, Washington, D C, has been appointed assistant professor in the department of pharmacology at the University of Cincinnati College of Medicine. Dr Wallace is 29 years old and a graduate of the School of Medicine, Division of Biological Sciences, University of Chicago. Before joining the National Institute of Health he was on the staff of the Food and Drug Administration. He recently received a grant from the National Advisory Cancer Council to carry on research on the endocrine relationships of cancer.

Lectures on Current Problems—The annual course of graduate lectures presented by the Cleveland Academy of Medicine was begun January 21 with an address by Dr Gerald S Shibley on "Treatment of Pneumonia". Future lectures will be:

January 28 Management of Hypertension Dr Roy W Scott
February 4 Treatment of Common Skin Disease Dr Clyde L Cummer
February 11 Treatment of Chronic Arthritis Dr Robert M Stecher
February 18 Treatment of Infections of the Genito-Urinary Tract, Dr Charles C Higgins
February 25 Management of Acute Exanthemata Dr John A Toomey
March 4 Treatment of Nephritis Dr Joseph M Hayman
March 11 Treatment of Peptic Ulcer Dr Vernon C Rowland
March 18 Management of Diabetes Mellitus Dr Chester D Christie
March 25 Treatment of Anemia Dr Russell L Haden

Technicians Trained for Pneumonia Control—Sixteen technicians from representative sections of Ohio attended an intensive one week course in pneumonia typing arranged by the state department of health at the University of Cincinnati in November. Dr Marion A Blankenhorn and his associates in the college of medicine were in charge of the course, which centered around the Neufeld reaction. Other methods also were studied. It is planned that as the next step in the program these technicians will make similar courses of instruction available to others in their respective localities. The state health department, of which Dr Walter H Hartung, Columbus, is director, planned the pneumonia control program to begin early in 1937 but had to postpone it because of the floods that struck the state in January and February. Social security funds financed the laboratory fee charges of the trainees.

OKLAHOMA

Tulsa County Appoints Executive Secretary—The Tulsa County Medical Society January 10 appointed Mr Lloyd Stone, former newspaper and advertising man and recently secretary of the Tulsa Junior Chamber of Commerce, as executive secretary of the society. Mr Stone is at present visiting medical societies that have executive offices to study their organization.

New Hospital Heads—Dr Henry K. Speed Jr, Sayre, has been appointed medical superintendent of the new Western Oklahoma Charity Hospital at Clinton. This is the former McLain Rogers Hospital, previously the West Oklahoma Baptist Hospital, which the state bought from Dr Rogers for a charity hospital as authorized by the last legislature.—Dr James A Land, Hobart has been appointed medical superintendent of the Western Oklahoma Tuberculosis Sanatorium, Clinton to succeed Dr Will C Wait, who will enter private practice in McAlester.

OREGON

Dr Dillehunt Portland's First Citizen of 1937—Dr Richard B Dillehunt, dean and clinical professor of surgery, University of Oregon Medical School, Portland was designated Portland's "First Citizen of 1937" at the annual banquet of the Portland Realty Board, January 6, at the Multnomah Hotel. Mr P H Parrott, retiring president of the realty board, who presided, presented to Dr Dillehunt a plaque recording his selection for the honor. The speakers were Gov Charles H Martin, Mayor Joseph K Carson Jr, Hamilton F Corbett, president of the Portland Chamber of Commerce, Frederick M Hunter, LL D, chancellor of the Oregon State Board of Higher Education, Eugene, and Dr Dillehunt. Mr David B Simpson was toastmaster. Dr Dillehunt a native of Illinois, graduated from Rush Medical College in 1910. He began practice in Portland in 1911 and from 1912 to 1917 was professor of anatomy and assistant dean at the university medical school. During the World War he served as orthopedic surgeon to Base Hospital No 46 of the American Expeditionary Forces. Since 1920 he has been dean of the medical school, clinical professor of surgery and chief of staff of the Portland Free Dispensary, since 1923 surgeon in chief of the Shriners' Hospital for Crippled Children. He is also chief of the orthopedic staff of the Doernbecher Memorial Hospital for Children and a member of the surgical staff of the Multnomah Hospital and Emanuel Hospital.

PENNSYLVANIA

Society News—Dr Herbert M Friedlander, Washington addressed the Washington County Medical Society, Washington, January 12, on fever therapy.—The staff of the Harrisburg Tumor Clinic presented a symposium on cancer at the meeting of the Dauphin County Medical Society, Harrisburg, December 6.—Drs Arthur W Phillips, Philadelphia, and Hugh R Gilmore Jr, U S Army Medical Corps, Washington, D C, discussed influenza at the meeting of the Harrisburg Academy of Medicine, December 21.

Philadelphia

University News—Wendell M Stanley, Ph D, associate member of the Rockefeller Institute for Medical Research, division of animal pathology, Princeton, N J, delivered the annual Alpha Omega Alpha Lecture at the University of Pennsylvania School of Medicine January 13 on "Recent Developments in the Study of Viruses".

Society News—Dr Nicholson J Eastman, Baltimore, was a guest of the Philadelphia Pediatric Society, January 11, speaking on "Asphyxia of the New-Born".—A symposium on gastro-enterology was presented before the Northern Medical Association of Philadelphia January 17 by Drs Anthony Bassler, Roy Upham and I Newton Kugelmass, all of New York.

Medical Dental Program—A meeting on the interrelationship of medicine and dentistry has been arranged by the committees on medical education of the Philadelphia County Medical Society and Philadelphia County Dental Society to be held during the annual Greater Philadelphia meeting sponsored by the dental society, February 2-4. Dr Rufus S Reeves will preside at the joint meeting, which will be held Wednesday afternoon February 2 at the Benjamin Franklin. The speakers will be Drs Stanley P Reimann, on "Cancer with Relationship to Dentistry", Edward S Dillon "Diabetes and Dentistry", Isadore Kaufman, "Tuberculosis and the Dental Profession". Dr William P Belk, Ardmore, Pa, will discuss laboratory aspects of diabetes and tuberculosis as related to dentistry.

TENNESSEE

Society News—The fifty-third annual Mid South Post Graduate Medical Assembly will be held in Memphis February 15-18, under the presidency of Dr Carl R Cruikshank, Nashville.—Dr Nathan E Hartsook, Johnson City addressed the Washington County Medical Society, Johnson City, December 9, on "Relation of General Medicine and Dentistry to Ophthalmology and Otolaryngology".

Hospital Institute—An institute on diseases of the blood was held at the Holston Valley Community Hospital, Kingsport, November 26, with Dr Marion A Blankenhorn, professor of medicine, University of Cincinnati College of Medicine, as the guest speaker. Dr Blankenhorn conducted a round table discussion on blood dyscrasias at an afternoon session and spoke in the evening on nutritional anemia.

WASHINGTON

Society News—Dr Siegfried J Thannhauser, Boston, addressed the Spokane County Medical Society, Spokane, January 11, on "Cholesterol Metabolism and the Different Groups of Xanthomatous Disease"—Drs Joel W Baker and John M Blackford, Seattle, addressed the King County Medical Society, Seattle, January 17, on "Surgery in Peptic Ulcer" and "Emergencies in Peptic Ulcer with Particular Reference to Massive Hemorrhage" respectively

GENERAL

Culture Collection Transferred—The American Type Culture Collection has been transferred from the John McCormick Institute for Infectious Diseases in Chicago to Georgetown University Medical School, Washington, D C The curator is Dr Mario Molari

Examinations in Ophthalmology—The American Board of Ophthalmology will hold examinations in San Francisco June 13, Washington, D C, October 8, and Oklahoma City November 15 Applications should be filed immediately and case reports must be filed not later than sixty days before the date of examination For information write to Dr John Green, 3720 Washington Boulevard St Louis

The Rocky Mountain Medical Journal—The state medical societies of Colorado, Utah and Wyoming and the Colorado Hospital Association are represented in the *Rocky Mountain Medical Journal*, the first issue of which appeared early in January The new publication supplants *Colorado Medicine* and the quarterly journal published by the Utah State Medical Association, but the ownership continues with the Colorado State Medical Society The format is the same as that used in *Colorado Medicine*

Meeting of Otolaryngologists—A meeting of the Eastern Section of the American Laryngological, Rhinological and Otolaryngological Society was held in Philadelphia January 7 at the Bellevue-Stratford Among other speakers were

Dr Ebenezer Ross Faulkner New York Problems in Diagnosis and Treatment of Hyperplastic Sinusitis and Allergy
Dr Walter Huggison Philadelphia The Inner Ear from an Experimental and Clinical Standpoint
Dr Edwin P Seaver Jr New Bedford Mass Chronic Nasal Sinusitis and Refined Carbohydrate Selection
Dr John R Simpson Pittsburgh Pharyngomaxillary Infection
Dr Mervin C Myerson New York Studies to Evaluate the Placement of the Preventive Solutions for Poliomyelitis

Lilly Prize Awarded to Dr Horsfall—Dr Frank L Horsfall Jr of the staff of the Rockefeller Institute for Medical Research, New York, received the Eli Lilly Award of \$1,000 at the annual banquet of the Society of American Bacteriologists at its meeting in Washington as the scientist under 31 years of age who accomplished the most outstanding research in bacteriology or immunology in the United States during the preceding year Dr Horsfall's investigations have dealt with the properties of serums in immunizing reactions, one result of which has been the development of pneumonia serums made from rabbits Dr Horsfall graduated from McGill University Faculty of Medicine, Montreal, Que, in 1932 and joined the staff of the Rockefeller Institute in 1935

Foundation for Infantile Paralysis—A nation wide campaign for funds to establish the National Foundation for Infantile Paralysis recently set up by President Roosevelt was begun January 17 and will terminate with the fifth annual celebration of the President's birthday January 29 A founders' plan to enable a person to subscribe \$1, \$2 or \$5 to the new foundation has been adopted This year all funds collected will be turned over to the new foundation and will be used in four types of activities for scientific research on the disease, for emergency aid in epidemics, for after-care of victims and for allotments to orthopedic centers, hospitals and clinics for specific programs within individual communities It is hoped that two million persons will be enrolled at \$1 each, but no definite goal has been set, it was said The first birthday balls held in 1934 yielded \$1,003,030 all of which went to the Georgia Warm Springs Foundation at Warm Springs, Ga and was used for research, for offsetting annual deficits of about \$100,000 a year and for a fund for building maintenance and contingencies of the foundation In 1935 funds raised from the birthday balls were divided on a basis of 70 per cent for local communities and 30 per cent for research, the latter amounted to \$241,000 which was allocated to research workers In 1936 and 1937 Warm Springs received 30 per cent of the proceeds of the balls, and 70 per cent remained in the local communities The total received by Warm Springs since 1934 is \$1,350,030, the national treasurer, Mr Keith Morgan, New York, announced

Government Services

Annual Report of Food and Drug Administration

The Ohio Valley flood of January and February 1937 presented one of the most unusual problems of the year to the U S Food and Drug Administration, according to the annual report for the fiscal year ended June 30, 1937 The administration assigned forty-four members of its personnel to the flood work, they were assisted by eighty men from state and city food inspection agencies and from other federal agencies The foods and drugs handled amounted to enough to maintain a city of 200,000 for a year The report states that 74,584 tons of foods and 141 tons of drugs were condemned or required to be cleaned Commodities packed in hermetically sealed containers were "reconditioned" by cleaning and sterilization of the containers

A case of food poisoning reported from an Eastern city apparently was caused by the eating of raisins Analysis of samples from the container and of other packages in the same shipment showed hydrocyanic acid The offending product was part of a stock of dried fruits held in San Francisco during the maritime strike and at the end of the strike it had been fumigated with hydrocyanic acid gas Seizure of 280,000 pounds of raisins followed Only the lot responsible for the illness was found to contain a dangerous amount of the acid, but the industry has discontinued the use of this fumigant

The fruit and vegetable industry and state authorities are increasingly concerned with the spray-residue problem, with the result that the federal authorities made only 125 seizures of these products Of these seizures eighty-seven were of apples, contrasted with 106 in 1936 and 299 in 1935

Sixty-seven alleged food poisoning outbreaks were investigated during the year In forty-four of these the symptoms were those of gastro enteritis and in twenty-five suspicion was directed toward foods extensively handled during preparation and made of ingredients that favor bacterial development if not properly preserved, such as salads, pastries with cream fillings and sandwiches filled with meat and fish

Improvement was noted in the salmon industry during the year, ninety-four consignments having been seized as compared with 145 the previous year Examination of sixty-two samples representing fifteen domestic manufacturers of canned tuna resulted in five seizure actions against three manufacturers

Frauds in foods included water in a wide variety of products, mixture of fresh marjoram and thyme leaves with leaves from which most of the strength had been removed, and coffee chaff sold as being suitable for mixing with coffee

The administration examined 1,500 samples of drugs representing 897 manufacturers Criminal prosecutions were instituted against fifty-two defendants and 161 seizures representing 124 shippers Chemicals and preparations purporting to comply with requirements of the U S Pharmacopeia accounted for thirty-two seizures and criminal prosecutions against thirty-five manufacturers Among these were three prosecutions for marketing substandard glandular preparations Chemicals and preparations purporting to be of National Formulary quality accounted for three seizures and criminal action against twenty-one manufacturers Of 2,689 containers from 227 shipments of anesthetic ether, 219 containers failed to meet pharmacopoeial requirements Twenty cans of the ether were found to be objectionable because of the presence of iron rust One hundred and forty-one cans showed excess peroxide and twenty-four were high in aldehyde content

The omission of an appropriation for the year 1937-1938 brought to an abrupt close a research program on the toxicology of arsenic and lead, begun in 1936 by the division of pharmacology, which was established in 1935 During the fiscal year this division biologically assayed 483 drugs and drug preparations among them various gland preparations A total of fifty-four gland products of domestic origin and one from an import source were examined, thirty-nine were estrogenic preparations, eight corpus luteum and eight miscellaneous products Of the estrogenic preparations, thirteen warranted legal action Of the corpus luteum samples, only three were of satisfactory potency

Altogether the administration collected and examined 48,352 samples of foods and 15,242 of drugs during the year Criminal prosecutions and seizures were based on 1,651 samples of foods and 613 of drugs Notices of judgment were published in 1,700 cases during the year, 1,355 dealing with food cases and 345 with drug cases Fines varied from as low as \$1 or \$2 to a maximum actually paid of \$1,500

Foreign Letters

LONDON

(From Our Regular Correspondent)

Dec 24, 1937

The Use of Alcohol

No question in therapeutics has been so widely discussed by authorities as the value and indications for the use of alcohol. Physiologists and clinicians have done all they could to answer it, yet it cannot be said that agreement has been reached. In one way, however, progress has been made. In the second half of the nineteenth century a reaction took place against the widespread use of alcohol both in health and in disease. The temperance movement restricted its use as a beverage, and clinicians ceased to rate it so highly. The huge doses given in fevers and other conditions were abandoned. An important conference on the prevailing national consumption of alcohol has been held at the University of London by the National Temperance League with the object of emphasizing the need for fuller consideration by public authorities of the physical, social, economic and moral effects of the prevailing consumption of alcohol, especially in relation to the national campaign for nutrition and physical fitness. The conference of course represented the opponents of alcohol, but the eminence of some of the speakers gave weight to their views.

Sir Humphry Rolleston said that, in certain circumstances in those convalescent from disease and in debilitated old age, alcohol might serve a useful purpose in exciting appetite for food and facilitating digestion. Also in the last stages of life, when the sands were running out, alcohol might be merciful and comforting. But that did not justify the widespread cocktail and sherry parties, which might depress the protective function of the liver and lead to addiction. Clinical experience showed that addiction impaired the power of resistance to infection. Weeks found that the mortality of pneumonia was 50 per cent in heavy drinkers, 34 per cent in moderate and 23 per cent in occasional drinkers and abstainers. Alcoholism might play a contributory part in some forms of mental disorders. Sir Humphry Rolleston said in conclusion that what was required was education, not prohibition. In America the latter had produced a most undesirable reaction.

Sir Frederick Gowland Hopkins (biochemist) found the question Is alcohol in any sense a food? difficult to answer in clear-cut terms. No subject of scientific inquiry had led to such contradictory results. Even the scientifically trained could not always avoid the subconscious effects of bias. The difficulty was inherent in the experimental problem itself. The fact that alcohol was oxidized by the tissues was no proof that it thereby fulfilled the functions of a food. Oxidation was one of the means whereby the body got rid of matter foreign to the economy. Without evidence to the contrary it might legitimately be supposed that alcohol came in this category. Was the energy which the combustion of alcohol liberated in the body available for the support of muscular activity? Modern studies of the chemistry of muscular contraction gave good reasons for doubting that alcohol could play a significant part in it. The chemical machinery involved was so subtle and so highly specialized that it was difficult to see how any fuel except sugar could be adequately employed. The other natural foods, certainly the proteins, could be partly and rapidly converted into sugar. But alcohol certainly was not so converted. From careful studies Hopkins had drawn the conclusion that work did not increase the rate at which alcohol disappeared from the blood and tissues. He finally deprecated the subtle trade propaganda to persuade the worker that beer made him more robust and increased the power of his muscles, thus tempting him to increased consumption and helping to salve his conscience as to expenditure which he could not afford.

New Laboratories at the Royal College of Surgeons

The Bernhard Baron Laboratories have been added to the Royal College of Surgeons at a cost of \$150,000 as a memorial to the philanthropist of that name. At the opening ceremony the president, Sir Cuthbert Wallace, said that in 1800, when the college had just moved to its present site, its chief preoccupation was the housing and care of the Hunterian collection, making it accessible to students and practitioners. Owing to the amazing development of comparative anatomy in the first quarter of the nineteenth century, the work of the collection chiefly lay in that direction. It took thirty years to make the catalogue. The next phase was the development of the pathologic side of Hunter's collection. In 1847 Paget was appointed Arris and Gale lecturer and it was he who laid the foundation in this country of surgical pathology. His work and later that of Shattock created a national type collection of pathology in the College Museum. Under the inspiring influence of Keith the museum became a center of anthropological research. Under the presidency of Lord Moynihan the old laboratories were enlarged and the college was brought more intimately into contact with surgical problems. Another development was the Buckstone Browne gift of \$500,000 which provided the college with a field laboratory, the efficiency of which made the London accommodation appear poor. The new laboratories will accommodate thirty workers. It is desired to create a school of experimental surgery to train young surgeons in the technique of investigation and in scientific outlook.

Radium Beam Therapy

A department of radium beam therapy has been opened by Sir Cuthbert Wallace, president of the Royal College of Surgeons. The apparatus has been designed in cooperation with Radium Beam Therapy Research and incorporates the latest improvements. Special attention has been given to safeguarding the patients and the staff from injurious radiation. The unit at present consists of 2 Gm., but allowance has been made for an increase. When not in use the radium is housed in a lead safe with a wall 10 inches thick, and is conveyed to the container after this has been suitably adjusted to the patient by air pressure and on completion of the treatment is returned to the safe automatically by vacuum. The beam is produced by means of an opening in the lead container, to which is fitted an applicator made from a special tungsten alloy that has a high protective value and is superior to lead in toughness and density, so that it provides protection without bulk. This is required in approaching a concave surface, such as the root of the neck. A stricter localization of the beam than was previously possible is thus provided. The amount of radium available allows work at a surface distance of 8½ inches.

George Henry Falkiner Nuttall

Dr. George H. F. Nuttall, F.R.S., eminent professor of biology in the University of Cambridge, has died suddenly in London at the age of 75. His researches in bacteriology, parasitology, hygiene and physiology had made him famous all over the world. Born in San Francisco, where his father practiced as a physician, he was educated in Europe until his eighteenth year, when he returned to America and entered the University of California, where he graduated M.D. in 1884. A year later he entered Johns Hopkins University, where he began his research. From 1886 to 1890 he worked at Göttingen, where he graduated Ph.D. On returning to Baltimore he became assistant to Professor Welch. In 1893 he went again to Germany to prepare for the chair of hygiene at Baltimore. After having contracted a German marriage, he joined the Hygienic Institute of Berlin. In 1899 he went to Cambridge to teach bacteriology and preventive medicine. He was elected fellow of Christ Church College and reader in hygiene in the University. In 1906 he was appointed to the newly founded professorship

ship of biology. When the Molteno Institute for Research in Parasitology (the first of its kind in the British Isles) was established he became its director. He founded the *Journal of Hygiene* in 1901 and edited it to this year. He founded *Parasitology* in 1908 and edited it until 1933. His most important discovery was the demonstration of the bactericidal properties of blood serum and other body fluids. This pioneer work in immunology led to the discovery of antitoxic serum. He discovered the precipitin test for blood, which now is so important in forensic medicine. In 1904 he published his classic monograph *Blood Immunity and Blood Relationship*, which showed that there is a similarity in the chemical constitution of the blood of animals which are related phylogenically. His work on mosquitoes was of great importance. He published the first accurate distribution map of *Anopheles maculipennis* in England and showed how it corresponded with the past and present distribution of ague. He then carried out, in collaboration with Shipley, an extensive investigation of the biology and anatomy of this mosquito. He next investigated canine proplasmiasis in Europe, being the first to recognize the importation of this disease from Africa. In conjunction with Hadwen he discovered the curative value of trypan blue. Only the most important part of his extensive work, which he published in more than 200 papers and books, has been mentioned.

PARIS

(From Our Regular Correspondent)

Dec 25, 1937

Hospital Efficiency Impaired by Forty Hours a Week Law

Since the summer of 1936 a law has been in force limiting the working week to forty hours. At first only applied to factories and stores, it was soon extended to cover all institutions caring for the sick. The effect of enforcement of the law in hospitals and sanatoriums was graphically described in a paper by Dr. Georges Duhamel, read at the Dec 7, 1937, meeting of the Académie de médecine. Duhamel has an international reputation as a writer and is considered one of the most representative members of the modern French school. He is also a physician but does not practice. He began by calling attention to the fact that physicians have remained faithful to the tradition that service to the sick and injured must be considered as being above all the duty of a medical man. No matter at what hour he is called and irrespective of his wishes for privacy and personal comfort, he is always ready. He knows no limitation of hours such as modern social laws have provided for others. But it is not only the medical profession which must adhere to this tradition of self sacrifice in behalf of the sick; it applies equally to the personnel of hospitals, especially those who are directly engaged in the nursing side of medical care. Duhamel then cited a number of examples of how the forty hour a week law has impaired the efficiency of French hospitals. To comply with the law and require only the legal number of hours service by nurses, it has been necessary to call in hurriedly many inexperienced nurses. The attending physicians feel that the treatments which they have ordered are not being properly carried out. The service of sterilizing dressings is so handicapped by the decrease in personnel that surgeons are allowed to operate only a limited number of days a week and even then are not sure that the instruments and dressings have been adequately sterilized. The result of such a lack of confidence of those who are responsible for the care of the sick and those who must aid them has been to engender a number of clashes between attending physicians and personnel. The patients are the first to suffer from this chaos and they are helpless. Duhamel called on the nursing personnel to remember that their calling was one of self sacrifice like that of the physician, which knows no hours.

This paper was the subject of extensive comment in the daily journals and brought forth a denial from Dr. Mourier, director of the Public Hospital Service in Paris, that conditions described by Duhamel were frequent. Every effort is being made to utilize experienced persons to fill in the gaps created by reducing the number of hours per week required of nurses.

Chemotherapy of Cerebrospinal Meningitis

At the Oct 29, 1937, meeting of the Société médicale des hôpitaux two reports were made of rapid recovery of cases in a child and a nursing of cerebrospinal meningitis following the administration of sulfanilamide. The first case was reported by Armand-Dehille and his associates. The child was 4 years of age and presented a typical syndrome of meningitis of forty-eight hours' duration, the spinal fluid showing 350 cells to the cubic millimeter and the culture yielding meningococcus B. Twenty cubic centimeters of polyvalent antimeningococcus serum was given intraspinally, 40 cc of the same serum and 20 cc of antimeningococcus serum B being administered subcutaneously. At the same time 2 Gm of sulfanilamide was given by mouth. No improvement being noted, larger doses (4 Gm) of the drug were given the second day, followed by marked improvement of symptoms and the clearing up and absence of meningococci in the spinal fluid.

The second report was by Weill-Halle and his associates. The patient was a nursing 13 months of age with symptoms of meningitis. The spinal fluid showed a large number of extracellular and intracellular gram-negative cocci and leukocytes. Cultures confirmed the organisms as meningococcus B. Ten cubic centimeters of polyvalent antimeningococcus serum was injected intraspinally at once and also the following day. The chemotherapy was begun the second day because of the accentuation of the meningeal symptoms. In less than forty-eight hours the spinal fluid became clear and sterile on culture. Rapid recession of symptoms and recovery followed use of the sulfanilamide for the next six days. The authors believe that the drug is just as effective when given by mouth as when administered parenterally.

The Constitution and Structure of the Ultraviruses

At the Oct 26, 1937, meeting of the Académie de médecine Prof. Levaditi of the Pasteur Institute read a paper on the constitution and structure of the ultraviruses in which he stated that a strain of ultravirus which appears pure and is considered homogenous is not so in reality. It is composed of elementary corpuscles of different values from the point of view of their size, their pathogenic effects and, perhaps, of their antigenic properties. As a working hypothesis one can suppose that the elementary component of each ultravirus or bacteriophage is formed by a protein-like support or framework which is the seat of all the general characteristics found in all the ultragerms. It is a support or framework to which are attached a definite number of "active groupings" from which are derived the properties or true characteristics of each variety or species of ultravirus, such as antigenic qualities, lytic or neoformative activity and particularly selective affinity for cellular systems or certain other cell groups. If this hypothesis is correct, the dimensions of the elementary bodies or components ought to be proportional on the one hand to the size of the support and on the other hand to the number of active groupings that are attached to it. The more voluminous the support, the more apt is it to fix a larger number of groupings. In neurotropic ectodermoses, one is able to prove that the size of the ultragerms is proportional to the complexity and plurality of their functional characteristics.

Personals

NEW SURGEON GENERAL OF FRENCH ARMY

Owing to the fact that General Rouvillois, surgeon general of the army, has reached the age limit, his successor will be

General Savournin, at present in charge of the medical service of the Paris military district

LERICHE NOMINATED TO SUCCEED NICOLLE

Prof Rene Leriche, whose clinic at Strasbourg has been visited by many American surgeons and whose research work has established an international reputation for him, will in all probability be the successor of the late Prof Charles Nicolle at the College de France. Professor Leriche has just been nominated to be professor of medicine at this institution, where he will devote all his time to surgical research.

LACASSAGNE TO SUCCEED REGAUD AT RADIUM INSTITUTE

Prof Claude Regaud, who has been the guest at a number of American medical meetings, is obliged to retire as director of the Radium Institute of Paris, having reached the age limit. As his successor of this well known institution, Dr Antoine Lacassagne has just been nominated.

GRIGORE ELECTED FELLOW OF ACADEMIE DE MEDECINE

The president of the 1937 French Surgical Congress, Prof Raymond Gregoire, was elected a fellow of the Academie de medecine at its Nov. 23, 1937, meeting. This is one of the highest honors that can be bestowed on a member of the profession and was a justly merited recognition of Professor Gregoire's many important contributions to surgical literature and his excellent work as a surgeon at one of the large public hospitals of Paris.

BERLIN

(From Our Regular Correspondent)

Dec 6, 1937

New Developments in the Universities—A Shortage of Students

As mentioned in previous letters, rumors of the imminent closing of certain universities or departments of universities have repeatedly gone the rounds. These rumors have been largely based on the decrease in student enrolment. In most institutions of higher learning this decrease has been considerable. The fear also is expressed that the ranks of the younger generation of educators, those men who must needs succeed to the professorial chairs, are undergoing depletion.

National Minister of Education Rust has frequently denied that the closing of any university is at present contemplated by the government, his statements of reassurance are, however, most cautiously worded. Rust took the occasion of the recent jubilee of Breslau University to refute the implication that national socialism was the foe of scientific training and research. What the party opposes is merely an erroneous concept of science. National socialism substitutes its own philosophy of science for the liberalist concepts. Science is no detached, freely floating abstraction, divorced from time and space, but a specific emanation of the national soul. A great discovery may of course be made by the individual scientist working alone as well as by cooperating research groups. On the occasion of the jubilee of Heidelberg University, Rust stressed the necessity of maintaining the universities (a necessity which had been questioned in many circles) and at the same time stated that 'the function of the university is to provide vital vocational training in the academic professions'. In the same address Rust urged for the universities a greater emphasis on the practical, namely, a greater development of professional schools. But he hastened to add that "it would be unreasonable to disestablish great institutional units like the universities and maintain only so many separate professional schools". It is far better that the research and educational aspects of German learning should continue hand in hand. In a third oration delivered at the jubilee of Göttingen University the minister spoke of academic freedom, recognized for centuries as a characteristic attribute of German universities. Academic freedom,

he said, means to students, the youthful "academic citizens" a tradition styled them, the freedom of vocational determination and on the other hand for the universities, as institutions, it signifies the freedom of learning. At this point Rust attacked the unrestricted freedom of the individual, "Believe me," he said sententiously, "evil spirits lurk behind that word 'freedom'."

Several other news items relative to academic affairs are of interest. German university professors, who are in fact civil servants *ex officio*, must obtain permission from the Ministry of Education if they wish to travel abroad. Applications should be made as early as possible, otherwise a professor may not have time to satisfy the necessary bureaucratic red tape and as a consequence he may be forced to cancel his trip. Lacking the proper permit, a professor cannot travel outside Germany. Even the itinerary of a contemplated foreign journey must be submitted to the authorities. According to the wording of the statute the foregoing restrictions are not designed to effect an arbitrary supervision of the professor's affairs but to render his travels in every respect more useful and beneficial. It therefore behooves the German professor traveling abroad to keep in touch with the representatives of the German government and with the foreign auxiliaries of the Nazi party. Students too must obtain special permits to travel abroad. These permits are issued by the national student's administration. Any evasion of this requirement is punishable. A student who expects to receive official permission to travel should make personal application at least one month prior to his prospective date of departure. If a student wishes to study abroad he must obtain from the students' administration a special academic furlough. As a rule, this furlough is not granted to students who have not completed two semesters. The rules are relaxed somewhat in the case of certain foreign universities: Geneva, Lausanne, Dorpat, Riga. None of the foregoing restrictions apply to study at Danzig.

A system of maximal student enrolment quotas was inaugurated at the larger universities in 1935 (THE JOURNAL, June 15, 1935, p. 2197, May 8, 1937, p. 1664). For the current winter semester (1937 to 1938) the maximal quotas at the larger universities (all departments) are Berlin 6,000 students, Frankfurt-on-the-Main 1,700, Cologne 2,400, Leipzig 2,500, Hamburg 1,700 and Munich 4,800. The purpose of this system is to keep the enrolment at the smaller universities from falling off. But as the result of various factors the number of matriculants has declined at virtually all the German universities. For one thing, the young men of today have turned to practical vocations which require less training, many prefer service in the defense forces and so on. The youth now find more numerous and better prospects of employment on completion of secondary school than at any time in recent years. Already a shortage of students has become noticeable in certain fields. For example, the small number of dental students, which became a topic of discussion in July 1936, again gave rise to concern in March 1937. A few years ago the universities were overcrowded and the youth were warned against the futility of academic study. Now the pendulum has swung in the opposite direction. The latest advices show that industry lacks about 5,000 engineers and that by 1942 this shortage will amount to between 30,000 and 35,000. A similar state of affairs exists among the chemists. Moreover, a shortage of university faculty members is now beginning to make itself felt especially with regard to assistants. Dr. Krauch, an official of the bureau for German raw material and industrial material, discusses the problem of the new generation of professional men in the journal *Vierjahresplan*. The author feels that all professional bureaus and organizations should make a united effort to check this neglect of the natural scientific and technical professions. But before any headway can be made in this regard the prospects of students in the natural sciences must be better than they are today.

A shortage in the number of physicians has likewise become noticeable. Quite recently Dr. Conti, Berlin municipal medical councilor and a prominent figure in the Nazi movement, has stated that there are too few hospital physicians in Berlin. The city is forced to get along as best it can by a strict economizing of the services of the present staff. Conti's observations are all the more interesting in view of the fact that certain Nazi circles continue to cry for the repression of those Jewish doctors who still remain in practice. Dr. Conti goes on to elucidate the situation and his attitude toward it. Economy measures have been necessary for quite some time owing to the lack of available doctors.

This dearth of physicians, now for the first time admitted by an official source, is not difficult to explain. The defense forces have drawn thousands of doctors from private practice and are making ever greater demands on the younger medical generation. The mentioned enrollment quotas in the larger universities have done much to keep the number of graduates in medicine at a low level. Political organizations as well as sport and health clubs require the service of more and more medical men. Finally one must not overlook such factors as the emigration, abandonment of practice and death of Jewish physicians.

Some further developments have taken place among the student bodies. All members of the *deutsche studentenschaft* who measure up to Nazi political requirements are asked to join section I of the Nazi *studentenbund*. In January 1937 a general restriction on membership in the *bund* was imposed. Since that time prospective members must pass through a two months probationary "training in fellowship." The "training" is entirely Nazi in character. The national student administration has made known the new set of rules and punishments for the German *studentenschaft* and the Nazi *studentenbund*. A special code applies to the members of the latter organization. The most severe penalty that the *bund* may impose on a member is dishonorable expulsion. The *studentenschaft* on the other hand may penalize an erstwhile member by excluding him from every university and professional school in Germany. A member of the *studentenbund* may also, as punishment for some transgression, be forbidden to wear the uniform and insignia for any period up to four months. In 1936 and the first months of 1937 the *studentenbund* sat in judgment on 178 of its members. Most of the defendants in these trials were able to win pardons but there were thirty-three suspensions and eight expulsions.

About two years ago (*THE JOURNAL*, Jan. 25, 1936, p. 309) the vacation-time employment of medical students as hospital nurses and attendants was reported. Since then this project has been successfully carried on in the universities of Prussia. Medical students who have completed five semesters are permitted to serve as nurses in the university hospitals during the summer. The Ministry of Education has recently announced a plan whereby all German medical students will be able to perform this service while still in their premedical semesters. Students on nursing service are to be *co ipso* insured against sickness and accident. The service may be performed only while the university is recessed. Enrollment in a nursing course is limited to twenty students and no course may last longer than four weeks. The number of these student assistants must not exceed 33 per cent of the regular trained nursing personnel of a hospital. Insane patients who require particularly skilful handling are to be attended only by student helpers if the most rigid supervision is exercised.

Congress on Research in Aeronautic Medicine

The first German Congress of Research in Aeronautic Medicine was held at the National Ministry of Aviation October 25-28. Dr. Hippke, medical inspector attached to the army flying corps, reviewed the development to date of aeronautic medicine in Germany. He spoke of the pioneer work in the

study of altitudes and speeds, protective measures against cold, waste gases and so on. All medical students at the universities are receiving special training in aeronautic medicine from specially commissioned instructors. In addition the effort is being made to acquaint the graduate physician with the knowledge gleaned from research in the new discipline. Prof. Hermann Rein of Göttingen, in a noteworthy lecture, discussed the interrelation of tissue respiration and pulmonary respiration as a special problem of aeronautic medicine. Other papers concerned the physiologic effects of altitude on the nervous system, problems relative to the organism's reaction to various rates of acceleration, and so on. From the tenor of the proceedings it became manifest that the problems related to the peculiar demands of aviation on the human organism are providing a broad field for medical research. Within recent years the principles of aeronautic medicine have been extensively and successfully developed in Germany through research studies of appropriate material.

AUSTRALIA

(From Our Regular Correspondent)

Nov. 26, 1937

Epidemic of Poliomyelitis in Victoria

In the last decade, epidemics of more than 100 cases of poliomyelitis in Victoria occurred in 1928, 1929, 1931 (269 cases), 1934 and 1937. The first case in the present outbreak was notified June 21 and occurred near Melbourne, seventeen further cases occurring later in this district. By September 19, 336 cases had been reported, according to the official journal of the Commonwealth Department of Health. This is the highest total ever recorded in Victoria. To that date there had been twenty-four deaths, including the death of one doctor. The salient feature of the epidemic was the initial explosive outbreak in the southeastern suburban district, with a later more widespread distribution in the metropolitan area. An accurate epidemiologic relationship was established between most of the cases. The highest incidence was in the 3-6 age group.

At the outset of the epidemic, the Victorian Public Health Department promptly took steps to minimize the outbreak. A consultative council was formed under the chairmanship of the chief health officer of the state. The boundaries of an "infected area" were defined, all schools in the area closed, gatherings of children prevented, and the voluntary closing of theaters to children under 16 years of age effected. School and home contacts were isolated and placed under medical surveillance. The movement of urban children to the country was restricted as far as possible. The services of experienced consultants were made available to the medical profession, the state bearing the expense. The parents of interstate travelers under 16 years of age have been advised not to proceed unless accompanied by a certificate from the medical officer of health stating that there had been no contact with known sources of infection. The public was advised that minor illnesses should be treated as potentially dangerous and infective until diagnosis excluded poliomyelitis. As cases occurred at schools outside the area originally defined, the schools concerned were closed.

As the epidemic increased in severity adjoining states endeavored to control juveniles arriving from the infected area in Victoria. In August the island state of Tasmania commenced to deal with children under 16 years of age arriving by sea or air from Victoria. Unless these children had a medical certificate indicating that they had not been in contact with any known cases of poliomyelitis, they were placed under domiciliary supervision for three weeks. August 19 a minor amendment of federal capital territory legislation provided that householders were required to report the arrival of persons under adult years. If that person had been in contact with known cases or living adjacent to known cases, isolation

at home was required. If there were no suspicions regarding infection, surveillance for a period of three weeks without restriction of movements was effected. August 20 the commonwealth government decided that the control of children from Victoria should be embodied in domestic legislation by the several states. Legislation was therefore enacted in New South Wales on August 25 to isolate noncertificated children under 16 years of age arriving from Victoria. The present outbreak has received more public attention than any previous epidemic of poliomyelitis, and steps to control the spread of infection have never been surpassed. However, the predominance in every poliomyelitis epidemic of mild but yet infective nonparalytic and often undiagnosed cases renders control extremely difficult.

Doctor Lost in Airplane in Northern Australia

The difficulties of medical service and the vastness of the sparsely inhabited areas of Northern Australia are illustrated by the experience of Dr. C. C. Fenton, who was not found for seven days after September 21, when he became lost. In response to a call to an outlying cattle station he left Newcastle Waters on that date in his Gipsy Moth airplane. As he also intended making a routine inspection of various stations along his route, no anxiety was felt at first when he was overdue. The owner of a cattle station 35 miles northwest of Newcastle Waters reported seeing Dr. Fenton's plane fly overhead on Tuesday, September 21, but when on Friday there was no further trace of him a search was begun by airplane and automobile. An airplane circuit of his projected route and the surrounding country was made, with no result. During the week end several mail planes altered their usual courses to make extensive detours over the country concerned, but there was no sign of the missing plane. Police searches from the stations around the area were equally unsuccessful.

September 28 the pilot of one of the searching planes saw smoke signals some distance northeast of one of the stations Dr. Fenton had been expected to visit. In a clearing in wooded country alongside a waterhole, Dr. Fenton's white airplane was seen. The doctor was found unharmed but weak. The concentrated food tablets he had carried in case of emergency were almost exhausted. He was given food and cold water and after an hour's rest was brought back to Newcastle Waters, where he remained under medical care for several days. After encountering a strong easterly wind, Dr. Fenton had missed the station that was his objective. He had landed three times in an attempt to find his position. He set out to return to the telegraph line but found that he had miscalculated his stock of gasoline and so made for a clearing near the Cox River waterhole. Reasoning, after landing, that an airplane search would not be commenced for several days, he began to clear a landing ground, though his work was impeded by flies, mosquitoes and heat. He used lint as flags to mark the ground, and also to write on the ground "O K You land." On the Wednesday he found a diving cow bogged in a waterhole, so he stunned it with a hammer and then cut its throat with a pocket knife. He had great difficulty in obtaining meat from the carcass, as it was covered in mud. He lived on steak of doubtful quality until Saturday, when even that source of supply ended, owing to putrefactive changes. As there seemed little possibility of his being able to obtain other food, Dr. Fenton rationed his food tablets to six a day. He was gradually becoming weaker but had plenty of water and considered that he could have lasted out another ten days. Arrangements are being made to take fuel out to the Gipsy Moth, and Dr. Fenton intends to go out and fly the machine back himself as soon as he has recovered.

Dr. Fenton's plane has had an interesting history. It was built in Canada and for some time was used as a seaplane among the Canadian lakes. It was then sold to one of the

pilots, a French Canadian, who took the machine to Los Angeles where it was thoroughly overhauled. Later this pilot flew to Australia, where an accident caused a crash while landing. The machine was again overhauled, and after being used for taxi and ambulance work, the people of Darwin purchased it by public subscription and presented it to Dr. Fenton in place of his previous machine, which had been wrecked.

BUCHAREST

(From Our Regular Correspondent)

Dec. 18, 1937

New Titles for Military Surgeons

The official gazette has published an order which regulates the denominations of the various ranks of military surgeons differently from those heretofore applied. Noncombatants will no longer be designated as officers. Military men with the rank of officers will be given names implying their professions. The new denominations of physicians will be as follows: (a) medic stagiar, corresponding to the previous rank of subaltern, (b) medic ajutor, corresponding to lieutenant, battalion surgeon, (c) medic regimental surgeon or commander of a company in the sanitary service, (d) medic principal, chief of the sanitary service of the division, chief of a hospital section, (e) medic subsef, chief of the sanitary service of the corps or chief of hospital, (f) medic sef, chief of the sanitary service of a corps, chief of the center for sanitary instruction, chief of the military hospital Regina Elisabeta, (g) medical inspector or medical inspector general, the sanitary chief of the army. The two latter ranks correspond to the ranks of generals of brigade and division.

With veterinary surgeons and pharmacists the highest obtainable rank is that of a colonel (veterinar sef, pharmacist sef).

The necessary qualification for attaining a rank is preliminary medical and military training. The rank of medic stagiar is obtained on the basis of the doctor's degree, conferred by a Rumanian university. The rank of medic ajutor requires advanced work at the faculty of medicine and at the military school. The rank of medic (captain) requires a preliminary half year's service at a military camp and one year's hospital practice. To be a medic principal (major), one must have successfully passed the prescribed military examinations and had two years' service with military troops and two years' hospital practice. Military surgeons who attended the so-called military schools can get the rank of medic principal without passing the special examination. The army grants subsidies and scholarships to students for the duration of the university years. Those enjoying these allowances are obliged to serve in the army for fifteen years.

Marriages

- JOHN CHARLES ROONEY, Santa Monica, Calif., to Miss Ethelyn Patricia Walsh of Chicago, Aug. 21, 1937.
MYER TEITELBAUM, Ann Arbor, Mich., to Missillian Rosenn of Wilkes Barre, Pa., Aug. 8, 1937.
CHARLES BUNCH, Charlotte, N. C., to Miss Rosemary Owen Reilly of Charleston, S. C., Dec. 27, 1937.
LAWRENCE E. SCHNEIDER, Warren, Pa., to Miss Florence Reaght of Ridgeway, Nov. 13, 1937.
ABRAHAM J. LEVIN, to Miss Lucille Zarne, both of Milwaukee, Oct. 24, 1937.
JOHN EDGAR KITE JR., Acmar, Ala., to Miss Mary Monza Land, Oct. 16, 1937.
MURRILL M. SZLCS, Youngstown, Ohio, to Miss Mary Louise Davis, Oct. 2, 1937.
CHARLES J. ROBERTS, to Miss Ruth Hashkins, both of Oklahoma, Oct. 2, 1937.

Deaths

Edward Parker Davis, Philadelphia, Rush Medical College, Chicago, 1882, Jefferson Medical College of Philadelphia 1888, emeritus professor of obstetrics at the Jefferson Medical College, where he was appointed professor in 1898, obstetrician to the Jefferson Hospital, obstetrician and gynecologist to the Philadelphia General Hospital, consultant to the Preston Retreat, superintendent of the Presbyterian Hospital, Chicago, 1884-1885, medical aide to governor of Pennsylvania under Selective Service Act, member of the Medical Board of Council of Defense, founder of the International Congress of Obstetricians and Gynecologists, fellow of the American College of Surgeons author of "Manual of Obstetrics," "Mother and Child," "Treatise on Obstetrics," "Obstetric and Gynecologic Nursing" and "Operative Obstetrics" contributed monographs on obstetrics and gynecology to standard textbooks aged 81, died, Oct 2, 1937, of myocarditis and arteriosclerosis

Henry Simpson Greenleaf ♂ Colonel, U S Army, retired Brookline, Mass., University of Pennsylvania Department of Medicine Philadelphia, 1895, entered the army as an assistant surgeon in 1899, promoted to captain in the medical corps of the army in 1904, rose through the various ranks to that of colonel in 1917, retired in 1925 for disability in line of duty veteran of the Spanish-American War served in the China relief expedition, the Philippine Insurrection and during the World War in 1923 lecturer of tropical medicine at the University of Cincinnati College of Medicine, member of the Massachusetts Medical Society, fellow of the American College of Surgeons, aged 67, died Nov 8, 1937, in the Peter Bent Brigham Hospital, Boston, of coronary occlusion

Charles Lynch ♂ Colonel U S Army, retired, Washington D C, Syracuse University College of Medicine, 1891, entered the army as assistant surgeon in 1893 was promoted to captain assistant surgeon in the medical corps during the Spanish-American War, major in the medical corps of the regular army in 1906, lieutenant colonel in 1914 and colonel in 1917 retired in 1924 for disability in the line of duty, was awarded the Distinguished Service Medal for conspicuous services as port surgeon during the World War, fellow of the American College of Surgeons co editor of the history of the "Medical Department of the United States Army in the World War" aged 69, died, Oct 29, 1937, in St Petersburg, Fla., of myocarditis and pulmonary edema

John Joseph Kindred ♂ New York Hospital College of Medicine Louisville, Ky 1889 also a lawyer, in 1936 received the honorary degree of doctor of laws from the John B Stetson University, De Land, Fla., where he had for several years taught medical jurisprudence, first president of the National Association of Private Hospitals, organized in 1934 was for ten years representative in Congress from the second New York congressional district, member of the American Psychiatric Association, owner and consulting physician to the River Crest Sanitarium, Long Island City, N Y, and the Belle Mead (N J) Farm Colony and Sanatorium aged 73 died, Oct 23, 1937, of circulatory collapse following influenza

John Hamilton, Cedar Rapids, Iowa, University of Pennsylvania Department of Medicine, Philadelphia, 1896 member of the Iowa State Medical Society, formerly instructor in venereal diseases at the State University of Iowa College of Medicine, Iowa City, and the State University of Iowa College of Homeopathic Medicine, Iowa City, veteran of the Spanish-American War, aged 66, died, Oct 22, 1937 in the University Hospital, Iowa City, of arteriosclerosis and heart disease

Arthur Shoudy Rowley ♂ Traverse City Mich., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1890, past president of the Grand Traverse Leelanau Medical Association, served during the World War, psychiatrist of the penal institutions of Michigan formerly assistant medical superintendent of the Traverse City State Hospital aged 71, died, Oct 24 1937, of myocarditis and chronic nephritis

Joseph Alexander Noblin, East Radford Va., Hospital College of Medicine, Louisville, Ky, 1907 member of the Medical Society of Virginia, for many years city physician and health officer of Radford formerly resident physician of Radford State Teachers College, past president of the Southwestern Virginia Medical Society, aged 57, died, Oct 22, 1937, of arteriosclerosis and cerebral hemorrhage

James Robinson English, Newark, N J College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1890, member of the Medical Society of

New Jersey, veteran of the Spanish-American War, on the staffs of the Irvington (N J) General Hospital and St Mary's Hospital, Orange, aged 71, died, Oct 24, 1937, of cerebral hemorrhage and diabetes mellitus

Francis Browne Grinnell, Boston, Harvard University Medical School, Boston, 1913, associate in bacteriology and immunology at his alma mater and the graduate school, member of the Society of American Bacteriologists, served with the British Army during the World War, aged 50, died, Nov 17, 1937, at South Wales, England

John W Toan, Howell, Mich., Detroit College of Medicine, 1898 member of the Michigan State Medical Society, formerly director of the tuberculosis division of the Herman Kiefer Hospital, Detroit, on the staff of the Michigan State Sanatorium, aged 69, died, suddenly, Oct 23, 1937, in Lansing, of coronary thrombosis

Asa H Speer, Corpus Christi, Texas, Memphis (Tenn) Hospital Medical College, 1902, member of the State Medical Association of Texas, past president of the Nueces County Medical Society, formerly health officer of Corpus Christi, aged 61, died, Oct 31, 1937, in a local hospital, of acute malaria

Harvey Elijah Wellman ♂ Providence, R I, Harvard University Medical School, Boston, 1926, served during the World War, on the staffs of the Rhode Island and Charles V Chapin hospitals, aged 45, died, Oct 20, 1937, in the Jane Brown Hospital, of acute gastro enteritis and toxic nephritis

Andrew Wilson Lawrence ♂ Brooklyn University of the City of New York Medical Department 1885, on the staffs of St Catherine's Hospital and St Cecilia Hospital for Women, aged 78, died, Oct 19 1937, in the North Country Community Hospital, Glen Cove, N Y, of hypertrophy of the prostate

John Hulst Muller, Grand Rapids Mich., University of Michigan Medical School, Ann Arbor, 1917, served during the World War, member of the Radiological Society of North America, on the staff of the Blodgett Memorial Hospital, aged 48, died, Oct 21, 1937, of carcinoma of the face

Henry William Jaeger ♂ Washington, D C, George Washington University School of Medicine, Washington, 1911, at various times on the staffs of the Casualty, Providence and George Washington University hospitals, aged 49, died, Oct 21 1937, of myocarditis and bacillary dysentery

Lamar Shepard Voorhees ♂ Newton, N J, University of Pennsylvania School of Medicine Philadelphia, 1918, past president and secretary of the Sussex County Medical Society, on the staff of the Newton Memorial Hospital, aged 43, died, Oct 31, 1937, of a self-inflicted bullet wound

Charles Walker Skipper, Corpus Christi Texas, University of Texas School of Medicine, Galveston, 1907, member of the State Medical Association of Texas, past president of the Nueces County Medical Society, aged 54, died, Oct 17, 1937, in a hospital at San Antonio, of leukemia

Alfred Hartman, Chicago Chicago Homeopathic Medical College, 1898, Hahnemann Medical College and Hospital, Chicago, 1905, member of the Illinois State Medical Society, aged 68 died, Nov 15, 1937, in the South Chicago Community Hospital, of carcinoma of the prostate

Timothy John Foley ♂ Worcester, Mass., Yale University School of Medicine New Haven, 1892, member of the New England Pediatric Society, on the staffs of the Worcester City Hospital and St Vincent Hospital, aged 69, died, Oct. 31, 1937, of acute coronary thrombosis

Sylvanus James Nunn, Binghamton, N Y, University of Pennsylvania Department of Medicine, Philadelphia, 1911, member of the Medical Society of the State of New York served during the World War, aged 48, died, Oct 19, 1937, of coronary thrombosis

Edwin Clyde Blackburn, Lock Haven, Pa., Hahnemann Medical College and Hospital of Philadelphia, 1896, member of the Medical Society of the State of Pennsylvania formerly examiner for the city schools, aged 64, died, Oct 28, 1937, of cerebral hemorrhage

Charles Vaughan Townsend, Mobile, Ala., Emory University School of Medicine, Atlanta 1924, member of the Medical Association of the State of Alabama, aged 37, died, Oct 28 1937, of multiple penetrating peptic ulcers of the duodenum

Leon Elias Peeler ♂ Sandusky, Ohio, University of the City of New York Medical Department, 1895 for many years associate physician to St Vincent's Retreat, Harrison, N Y aged 66, died, Oct 24, 1937, of arteriosclerosis and coronary disease

Doras Lee Stephens * Anson, Texas, Medical College of Alabama, Mobile, 1891, past president of the Jones County Medical Society, formerly mayor, at various times city and county health officer, aged 72, died, Oct. 28, 1937, of heart disease

Joseph L. Roe * Little Rock, Ark., University of Arkansas School of Medicine, Little Rock, 1927, on the staffs of the Baptist State and St. Vincent's hospitals, aged 38, died, Oct. 24, 1937, of laryngospasm, pulmonary edema and undulant fever

Joel Washington Wharton, Breckenridge, Texas, Southwestern University Medical College, Dallas 1905, member of the State Medical Association of Texas, aged 72, died, Oct. 20, 1937, in the West Side Hospital, of cerebral hemorrhage

Henry Fleet Gordon, Winnipeg, Manit., Canada, Western University Faculty of Medicine, London, Ont., 1903, L.R.C.P., Edinburgh, L.R.C.S., Edinburgh and L.F.P.S., Glasgow, 1906, aged 69, died, Oct. 30, 1937, in Norwood, of bronchopneumonia

Adam J. Riegel, Philadelphia, Hahnemann Medical College and Hospital of Philadelphia 1887, formerly member of the board of health of Lebanon, Pa., aged 75, died, Oct. 17, 1937, in the Hahnemann Hospital, of chronic myocarditis

George Kellogg Smith, Chittenango, N. Y., Syracuse University College of Medicine, 1915, served during the World War, on the staff of the Syracuse (N. Y.) Memorial Hospital, aged 47, died, Oct. 18, 1937, of coronary thrombosis

Charles W. Ory, Comanche, Texas, Fort Worth School of Medicine, Medical Department of Fort Worth University, 1905, member of the State Medical Association of Texas, aged 64, died, Oct. 9, 1937, of cerebral hemorrhage

George Louis Kilborn, Forestport, N. Y., Kentucky School of Medicine, Louisville, 1888, member of the Medical Society of the State of New York, aged 72, died, Oct. 17, 1937, of chronic nephritis and heart disease

William H. Sweeting, Savannah, N. Y., Hahnemann Medical College and Hospital, Chicago, 1881, member of the Medical Society of the State of New York, aged 86, died, Oct. 11, 1937, of chronic heart disease

Vincent Edward Quin, New York, University and Bellevue Hospital Medical College, New York, 1899, member of the Medical Society of the State of New York, aged 61, died, Oct. 1, 1937, of cerebral thrombosis

Rose Bare Sheridan, Bethlehem, Pa., Woman's Medical College of Pennsylvania, Philadelphia, 1905, aged 54, died, Oct. 21, 1937, in the Sacred Heart Hospital, Allentown, of heart disease and pulmonary edema

Harrie Augustus Patterson * Fort Stanton, N. M., Medical College of the State of South Carolina, Charleston, 1931, on the staff of the U. S. Marine Hospital, aged 33, died, Oct. 30, 1937, of pulmonary tuberculosis

Lester Walker Hunter, Charlotte, N. C., Bellevue Hospital Medical College, New York, 1875, member of the Medical Society of the State of North Carolina, aged 84, died, Oct. 27, 1937, of carcinoma of the face

Elijah Y. Pare * Leeton, Mo., Barnes Medical College St. Louis, 1898, past president of the Johnson County Medical Society, served during the World War, aged 65, died, Oct. 29, 1937, of diabetes mellitus

Hubert William Callahan * Tulsa, Okla., College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois 1911, served during the World War, aged 50, died, Oct. 11, 1937

Charles Wallace Thomas, Milton, Ore., Jefferson Medical College of Philadelphia 1892, president of the Umatilla County Medical Society, health officer of Milton, aged 70, died, Oct. 25, 1937, of peptic ulcer

Cornelia Barbara Kennedy, Findlay, Ohio, Toledo Medical College, 1896, formerly secretary of the Hancock County Medical Society, aged 75, died, Oct. 22, 1937, in the Home and Hospital, of carcinoma

Lyman Rufus Hinsdill, Keota, Iowa, Drake University Medical Department Des Moines 1894, Grand Rapids (Mich.) Medical College, 1902, aged 72, died, Oct. 22, 1937, of arteriosclerosis

Wirt Washington Sumlin, Nashville, Tenn. (licensed in Tennessee in 1909), aged 58, died Oct. 26, 1937, in the Hubbard Hospital, of paralytic poisoning and chronic myocarditis

Edwin Hirschfeld, San Antonio, Texas, Baylor University College of Medicine, Dallas, Texas 1928, aged 36, died Oct. 29, 1937, in Grand Canyon, Ariz., of cerebral hemorrhage

James Donnell Weir, Beardsley, Minn., Trinity Medical College, Toronto, Ont., Canada 1896, aged 73, died Oct. 21, 1937, at New York Mills, of chronic cardiovascular renal disease

Joseph J. Henke, Hydro, Okla., St. Louis College of Physicians and Surgeons, 1900, member of the Oklahoma State Medical Association, aged 63, died, Nov. 12, 1937, of heart disease

Joseph Gosling Denelsbeck, Trenton, N. J., University of Vermont College of Medicine, Burlington, 1891, aged 77, died, Oct. 28, 1937, of uremia and hypertrophy of the prostate

Andrew Jackson Robinson, Pauls Valley, Okla., University of Tennessee Medical Department Nashville, 1899, aged 71, died, Oct. 29, 1937, of hypertension and nephritis

John Franklin Walker, Lemmon, S. D., University of Minnesota College of Medicine and Surgery, Minneapolis, 1908, aged 64, died, Oct. 29, 1937, of carcinoma of the liver

David Augustus Myerle, Rockville Centre, N. Y., Long Island College Hospital, Brooklyn, 1882, aged 82, died, Oct. 22, 1937, of cerebral hemorrhage and bronchopneumonia

Charles William McKee, Long Beach, Calif., Kentucky School of Medicine, Louisville, 1886, aged 49, died, Oct. 17, 1937, of chronic myocarditis and cerebral hemorrhage

Joseph Thibault Didier Fischer, Phoenix, N. Y., Syracuse University College of Medicine, 1895, aged 82, died, Oct. 18, 1937, of chronic nephritis and heart disease

Louis Thompson Reed, Somerville, N. J., Jefferson Medical College of Philadelphia, 1884, aged 78, died, Oct. 7, 1937, in the Somerset Hospital, of bronchopneumonia

Henry Newton King, Baltimore, University of Maryland School of Medicine, Baltimore 1910, aged 49, died, in October 1937, at the University Hospital, of carcinoma

William Henry Rader, Collbran, Colo., University of Virginia Department of Medicine, Charlottesville, 1871, aged 90, died, Oct. 19, 1937, of lobar pneumonia

Julius Wilhelm Adalbert Schmidt, Union City, N. J., University College of Medicine, Richmond, 1901, aged 83, died, Oct. 22, 1937, of chronic myocarditis

Alexander Blair Thaw, Washington, D. C., Harvard University Medical School, Boston, 1886, aged 75, died, Oct. 5, 1937, in Boston, of military tuberculosis

Charles Edward Towle, Boston, University of the City of New York Medical Department, 1895, aged 65, died, Oct. 18, 1937, of chronic nephritis and uremia

George Uriel Hall, Winnemucca, Nev., Ensworth Medical College, St. Joseph, Mo., 1899, aged 61, died, Nov. 1, 1937, of carcinoma of the pharynx and glottis

Mary Bassett Leeds, Springfield, Pa., Woman's Medical College of Pennsylvania, Philadelphia, 1903, aged 87, died, Oct. 13, 1937, of chronic myocarditis

Robert L. Paxton, Sheridan, Ark. (licensed in Arkansas in 1903), member of the Arkansas Medical Society, aged 73, died, Oct. 29, 1937, of hypertension

Harry B. Fenner, Omaha, Chicago Homeopathic Medical College, 1884, aged 81, died, Oct. 24, 1937, of cerebral hemorrhage and arteriosclerosis

Hicks Martin, Zephyr, Texas, Reform Medical College of Georgia, Macon, 1870, was instantly killed, Oct. 31, 1937, in an automobile accident

John Russell Perkins * Winston Salem, N. C., Medical College of Virginia, Richmond, 1904, aged 57, died, Oct. 16, 1937, of myocarditis

Hilliard L. Lockwood, Jersey City, N. J., New York Homeopathic Medical College, 1879, aged 80, died, Oct. 25, 1937, of prostatitis

Joseph Thomas Nelson, Baltimore, Baltimore University School of Medicine, 1900, aged 66, died Oct. 26, 1937, of carcinoma of the lung

James Edward Prior, Boston, Baltimore University School of Medicine, 1896, aged 76, died, Oct. 10, 1937, in the City Hospital

Robert Willard Huffman, Lincoln, Neb., Hering Medical College Chicago, 1903, aged 78, died Oct. 21, 1937, of chronic myocarditis

Jerry C. Murphy, York Haven, Pa., University of Pennsylvania School of Medicine, 1890, aged 76, died, Oct. 30, 1937, of myocarditis

Jacob Quam, Deerfield, Wis., Rush Medical College, Chicago, 1891, aged 75, died, Oct. 1, 1937

Bureau of Investigation

ELI SIEGEL, M D

A Sexual Rejuvenation Fraud Debarred from the U S Mails

The mail-order business of Eli Siegel, M D, of 1119 Wilson Avenue, Chicago, carried on under the trade name "Dr Siegel's Medical Products," has been debarred from the mails because it has been declared a scheme for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises.

Siegel has operated under various trade names such as "Chicago Medical Institute," "Dr Siegel's Medical Products," "Chicago Medical Offices" and "Globe Surgical Institute." The biographic records of the American Medical Association show that Eli Siegel was born in 1898 and claims a diploma from the Chicago Medical School issued in 1927 and holds an Illinois license issued the same year. The Chicago Medical School is not recognized as an acceptable institution by the American Medical Association and it is reported that the licensing boards of only two states—Illinois and Massachusetts—out of the forty-eight states of the Union recognize its diplomas.

Siegel, it seems, has conducted an office for the treatment of patients in person, in addition to the mail order quackery. Under the name "Chicago Medical Offices—Dr E Siegel, Physician and Surgeon, Director," he has notified the public in display advertisements that he operated the 'North Side's Largest Health Center' and has claimed among his qualifications to be a "former staff doctor at Bremerman Urological Hospital" and also a "former staff Physician at Public Health Institute." His advertisements have featured, among other bargains

'Treatments for Prostate sexual weakness	\$ 1 00
'Female Ailments Treated (Leucorrhea or Whites)	1 00
'Treatment for Falling Hair and Baldness	1 50
'Tonsil operations	12 00
Maternity Service Including hospitalization Complete	50 00

The advertisement in which these bargain prices appeared was endowed with respectability on the grounds that, according to Siegel, it had previously "appeared in one of the largest newspapers in Chicago, the *Herald Examiner*."

In the mail order field, under his own name and that of "Dr Siegel's Medical Products," he appealed to sexual neurotics by offering for sale certain drugs and appliances that he claimed would make them "full of vim, vigor and vitality and feel thirty years younger." Siegel called his drug combinations "Revivo" and "Control-O", his appliance he dubbed the "Great Mechanical Developer." The "Revivo" treatment consisted of various colored tablets and came in three strengths, Single, Double and Triple ("Super"). They contained varying amounts of glandular substance—orchic prostatic, anterior pituitary, adrenal and thyroid, also Blaud's mass, nux vomica, arsenic trioxide, damiana, and so on. Siegel claimed that the tablets supplied "love endocrine hormones" and that they would not only restore sexual vigor to men up to 76 years of age but would reduce an enlarged and diseased prostate gland to "normal."


Siegel advertised certain premiums that he would send to those who ordered his mail order medicines. With a \$3 order he would send "Free Diet, plus 3 rubber preventatives" [sic]. The number of free condoms sent increased with the amount of the order. Those who ordered ten boxes of "Double Strength Revivo"—price \$14—received as a 'premium the Great Mechanical Developer, which the government declared was merely a mechanical masturbator. Siegel also sold Control-O which he claimed "Prolongs—Delays—Thrills." This was for 'nervous people who tend to complete the act too fast. The government chemists reported that Control O' was a salve to be applied locally and contained anesthetics, menthol and oil of cade in a petrolatum cold cream base.

While Siegel in his literature led prospective purchasers to believe that they would be treated as private patients and given personal, individual attention, it was reported by the post office inspectors that the letters that came in were actually handled

by Siegel's wife and referred to Siegel himself only in cases in which there were "any questions to be answered on medical subjects."

On April 28, 1937, Siegel—after due notice—was called on by the post office authorities to show cause why a fraud order should not be issued against "Dr Siegel's Medical Products" and Dr Eli Siegel himself. On that date Siegel's attorney, Mr Charles Rowan of Milwaukee, appeared in Washington and a two day hearing was held. Siegel himself did not appear, claiming as an excuse that he "was unable to secure a skilled endocrinologist to care for his Chicago establishment during his absence." After the hearing Mr Rowan requested, and was granted, an extension of time to May 8 to file a brief. After this was duly filed the Solicitor of the Post Office Department, Judge Karl A. Crowley, reviewed all the evidence and the facts in a memorandum to the Postmaster General, recommending the issuance of a fraud order and the closing of the mails to Siegel and his quackery. On May 25, 1937, the mails were closed to the "Dr Siegel Medical Products," concern and—more important—were also closed to Dr Eli Siegel himself.

In October 1937 the Bureau of Investigation of the American Medical Association received a letter from a California layman enclosing a letter he claimed to have received from the "Globe Surgical Institute" of 1119 Wilson Avenue, Chicago. The




Dr. SIEGEL, M. D.
Medical Director

Dr Siegel's Medical Products

Health Service Division

1119 Wilson Ave

Chicago Illinois



W. Doe, Genl.

Local and Long
Dist. office Telephone
AU Depo. EDGE 2-1018

Dear Friends:

I have information that you are in need of pep glandular medicines and that you have tried a great many pep products without receiving any benefit.

A great many of my former and present patients had the same experience - that they had tried a great many

correspondent asked for a report on the "Institute." The letter from the "Institute" set forth that it had developed a most successful operation "to overcome sexual weakness." An example of the wonderful results that might be expected was cited in the case of a "Mr C G of Indiana" who, according to the letter, was operated on Sept 27, 1937, and reported having had numerous erections each day after October 1. The price of the operation offered by the Globe Surgical Institute was \$300, half cash down before the operation and the balance later, provided the victim was "one hundred per cent satisfied with results."

The Department of Registration and Education of the State of Illinois was asked whether it could give the name of the person who was conducting the "institute." The department assigned an inspector to investigate the case and reported on October 24 that Eli Siegel was the man back of it. Siegel is said to have told the inspector that he had ceased advertising under the name "Globe Surgical Institute." As the letter received by the California correspondent was obviously written after Oct 7, 1937—the last date mentioned in the "report" of "Mr C G of Indiana"—Siegel's decision to abandon the new trade name was evidently recent.

Siegel's case is just another instance of an individual or a concern that has, after being debarred from the use of the mails, simply evaded the Post Office fraud order by continuing the scheme under a new name. This trick makes further action by the Post Office Department necessary, in the form of an extension of the fraud order, to cover whatever new names are being employed. If that department further extends its fraud order against Siegel's business to cover the name "Globe Surgical Institute," it will be interesting to observe whether he will devise still another one so as to continue his mail-order activities.

Correspondence

ARTIFICIAL RESPIRATION BY INTRA-
TRACHEAL INSUFFLATION

To the Editor—I am indebted to Dr M Bernard Brahdy (THE JOURNAL, Dec 11, 1937, p 2006) for calling my attention to the article (Brahdy, Leopold, and Brahdy, M B *Am J M Sc* 178:405 [Sept] 1929) in which he described the development of a portable apparatus for carrying on prolonged artificial respiration by intratracheal insufflation. My inquiries directed to personnel interested in the care of such cases were not in the nature of research into the historical aspects of the situation. It was merely an attempt to determine practice now or recently in vogue.

The method devised by Dr Brahdy, while a decided improvement over the intratracheal technic of Meltzer, was apparently subject to the same complications which have rendered the Meltzer, Elsberg and other intratracheal insufflation methods obsolete (Flagg, P J *Intratracheal Inhalation Anesthesia, Arch Otolaryng* 25:405 [April 1] 1937). Experience has demonstrated that it is not practical to attempt to use cumbersome, complicated, motor-driven apparatus at the home, in the ambulance or as part of one's emergency kit. On the other hand, equipment is now available and in common use that can be wrapped in a towel and carried in a small hand bag (oxygen supply excepted), whereby results similar to those described by Dr Brahdy may be secured (Flagg, P J *Asphyxia, Arch Otolaryng* 12:23 [July] 1930).

I am heartily in accord with Dr Brahdy's reference to clinical practice, and I have repeatedly emphasized these conclusions (Flagg, P J *The Color of the Blood as a Sign of Death, M Times & Long Island M J*, July 1933, p 205).

Dr Brahdy's response would seem to confirm my previous impression, namely, that simple equipment for intratracheal intubation and insufflation to prevent sudden asphyxial death is not generally available in institutions caring for terminal poliomyelitis and that this condition exists in spite of the fact that no objection is advanced against the use of this emergency treatment.

P J FLAGG, MD, New York

RESUSCITATION

To the Editor—In trying to correct one error I seem—unadvertently—to have promoted another. In *THE JOURNAL*, Nov 6, 1937, page 1561, I showed that forcible artificial respiration of the asphyxial new-born by means of apparatus of the pulmotor type, such as the E & J Resuscitator, is contrary to sound principles and may sometimes be harmful. In place of such treatment I suggested that "the passage of a soft catheter into the trachea of an apneic and flaccid baby is so simple an operation and insufflation by the Meltzer-Flagg technic is generally so effective that there is little justification for any other procedure."

To my amazement and horror, Dr I Lyman Hurlbut in *THE JOURNAL*, Dec 25, 1937, page 2157, takes this recommendation to mean 'the procedure of inflating the infant lung as one would a balloon,' and he adds, on the basis of the recent paper of Wilson, Torrey and Johnson (*Surg Gynec & Obst* 65:601 [Nov] 1937) that there is compelling experimental evidence that forcible inflation of the infant lung, even when done under extreme control, is not only useless but as unsound physiologically, and harmful anatomically as any respirator or pulmotor."

In that statement I fully concur. What Dr Hurlbut and, perhaps others fail to realize is that intratracheal insufflation is not done for the purpose of inflating the lungs. It should not inflate and, if properly done, it cannot inflate. It merely

supplies oxygen so deep in the respiratory tract that the blood is oxygenated without any respiratory movement of the chest. The catheter should be small enough to allow ample space between it and the walls of the trachea for the excess gas to escape freely. This was Meltzer's technic (*THE JOURNAL*, May 10, 1913, p 1407) and Flagg has not altered it.

While on this subject I may add that intratracheal insufflation is also the best treatment for patients under spinal anesthesia in whom the drug happens to reach the roots of the phrenic and other nerves to the respiratory muscles. In the resulting respiratory paralysis, neither artificial respiration nor carbon dioxide inhalation is effective, but, with a jet of oxygen blown into the bifurcation of the bronchi, the blood is sufficiently oxygenated to maintain life indefinitely. So Meltzer found, but he found also that under insufflation in adults the elimination of carbon dioxide is decidedly subnormal. To meet this condition he recommended that the thorax be compressed by hand several times a minute. When the anesthetic block of the respiratory nerves wears off, natural respiration returns.

In a flaccid asphyxial baby the accumulation of carbon dioxide would aid in starting respiration once the blood is adequately oxygenated by insufflation.

YANDELL HENDERSON, PH D, New Haven, Conn

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT HOWEVER REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

TOXICITY OF ALUMINUM IN KITCHEN UTENSILS

To the Editor—One of my patients has been asking me about aluminum kitchen ware. The people who go round selling stainless steel are telling some of my patients that the American Medical Association some years ago condemned aluminum kitchen ware because it is injurious to health. Is that true and does the A M A still hold to that view? They are also told that the aluminum vessels may induce cancer. That sounds like nonsense to me. But it seems to me that some years ago also that view was held in otherwise well informed circles.

PETER G BERKNOLT MD Paterson N J

ANSWER—This old problem of toxicity from metallic aluminum utilized in millions of household utensils comes up with frequency. *THE JOURNAL* does not accept as proved any contention that metallic aluminum as used by householders is in any wise injurious to health, nor is it known to be a source of cancer. The attitude of the majority of the scientific world is indicated in a series of excerpts from various publications, some of which have earlier been abstracted in *THE JOURNAL*.

Beal, Unangst, Wigman and Cox (*Aluminum Content of Foodstuffs Cooked in Glass and Aluminum, Indust & Engin Chem* 24:405 [April] 1932) reported a study in which general foods of average diet were cooked in glass and aluminum vessels and were analyzed for aluminum. The taking up of aluminum by neutral foods was negligible, acid and alkali foods are relatively more corrosive. In no case, however, did this find sufficient aluminum dissolved from utensils to interfere seriously with phosphorus absorption. An average daily intake in case all foods are cooked in aluminum is 12 mg, of which 5 mg is derived from the utensils. Sugar decreases corrosion of aluminum utensils. The largest amount of aluminum was found in apple butter cooked six and a half hours and containing 118 parts per million as compared to 1,400 parts per million necessary to produce the first symptoms of phosphorus starvation in animals. No systemic pharmacologic effects can be ascribed directly to absorbed aluminum. Aluminum does not appear to be cumulative in tissues.

Other workers generally agree with these results. Lill, Hill, Peterman Gross and Krause (*Am J Physiol* 90:72 [Sept] 1929) analyzed numerous common foods and obtained a similar outcome. The presence of aluminum in a large variety of plant and animal tissue is upheld by several investigators (McCullum, Rask and Becker (*J Biol Chem* 77:753 [May] 1928), Myers and Mull (*ibid* 78:605 [Aug] 1928) and Wigglesworth and Bird (*J Am Chem Soc* 51:2964, 1929) present a list of

tative data. It would seem that early studies around the 1892 and 1893 period showed data of relatively little value, because they were obtained by the use of various grades of commercial aluminum unlike modern utensils and with the use of faulty and inadequate analytic methods.

Hodges (*Chem News* 123 141, 1921) found that strong tartaric, citric and previously boiled acetic acids had no effect on aluminum. Seligman and Williams (*J Soc Chem Indust* 35 88, 1916) reported work on the effect of several concentrated organic acids on aluminum and found their action to be slight. Maass and Wiederholt (*Ztschr Metallkunde* 17 115 1925) found that common organic acids had more effect on aluminum than did oxalic, acetic or tartaric acid. Utz (*Ztschr f angew Chem* 32 345, 1919) stated that dilute lactic acid (1 per cent) had no effect on aluminum at room temperature and that a slight amount was dissolved at higher temperatures but not enough to produce harm physiologically. Lunge and Schindl (*Ztschr f angew Chem*, 1892) and Rupp (*Dingler's Polytech J* 283 19, 1892) found an extremely slight solubility of aluminum in a few organic acids. Hunziker, Cordes and Nissen (*J Dairy Science* 12 140, 1929) treated aluminum sheets for five days at room temperature with acetic, butyric, lactic and citric acid in 1 per cent concentration finding a maximum of 0.2 per cent dissolution. Klut (1925), Ohlmüller and Heise (1893), Plagga and Lebbin (1893) and others hold similar opinions. Schwartz, Murphy and Cox (*J Nutrition* 4 211 [July] 1931), working with fresh milk the aluminum content of which was 0.07 parts per million found after pasteurization in aluminum for thirty minutes at 60°C a slight increase in concentration to 0.67 parts per million.

An authoritative work of this nature was reported by Poe, Warnock and Wyss (*The Action of Dilute Acids on Aluminum Indust & Engin Chem* 27 1505, 1935). This paper included a study concerning the degree at which aluminum cooking utensils could contribute to the presence of aluminum in prepared foods on the theory that acids present in foods are the aluminum dissolving substances. Brands of aluminum cooking utensils were subjected to tenth normal acids: Acetic, citric, glycolic, lactic, malic, phosphoric, propionic and tartaric acids and their dissolving properties were given in milligrams per hundred square centimeters of surface. Acids were both boiled and simply allowed to stand from two to twelve weeks. Loss of weight technique showed from 48 to 135 mg per hundred square centimeters of surface dissolved for acids at this concentration, while distilled water as a control gave a loss in weight of 35 mg per hundred square centimeters of surface. Of the inorganic acids the halogen acids seem to be most active. Of the organic acids, acetic and its chlorine derivations, formic and lactic are rather active, glycolic, hydriodic, malonic, oxalic and sulfurous acids show a decreased activity after a few weeks.

From the available data in the literature, it is evident that most of the acids of fruits and vegetables are more or less active on aluminum. Food acids may therefore be expected to dissolve some aluminum during the cooking process. However, the solubility of aluminum would be altered (probably retarded) by the presence of constituents other than acids on foods. The general acid concentrations in foods also are below those cited in experimental work.

The physiologic action of aluminum salts in quantities introduced to foods in the use of aluminum cooking utensils was considered not harmful by the Germans in a comprehensive study before the World War. To support the noninjurious contention, the following statements from *THE JOURNAL* and elsewhere are cited:

Bertrand and Serbesque (*Ann Inst Pasteur* 53 10 [July] 1934) reported two series of experiments on rabbits. A solution of aluminum sulfate representing 20 mg of aluminum metal per kilogram of body weight was introduced directly into the stomach by stomach tube. The necropsies revealed no visible lesions cancerous or otherwise in the stomach or the intestine. The authors concluded that the role of aluminum or its salts in the production of cancer has been greatly exaggerated. The fear of ingestion of minute amounts of aluminum from the use of utensils as well as from the foods is not justified by laboratory research.

In the Berlin letter (*The Use of Aluminum Vessels for Cooking THE JOURNAL*, Dec 13, 1930 p 1849) it was stated that on account of persistent assertions that the use of aluminum vessels for cooking is injurious to health because the cooking processes cause small particles of metal to become disintegrated the federal bureau of health instituted a thorough inquiry. After many experiments on animals extending over months and also observations on man with comparatively large doses of aluminum (much larger than would be involved in abrasions from cooking vessels) no manner of disturbance could be noted and it was found that the metal contained in the ingested metal

does not enter the body fluids from the intestine but is carried off through the gastro intestinal tract. Neither in the blood, the urine nor the organs and tissues of dogs allowed to ingest significant doses of aluminum during the year's experimentation, could more aluminum than usual be found. Nor could any injuries to health or even disturbances of well-being be observed in man. Thus the opinion of the bureau rendered in 1893 is confirmed, that household and kitchen vessels of aluminum can be employed with perfect safety.

In the Berlin letter in *THE JOURNAL*, Sept 23 1933, page 1012 it was reported that the federal bureau of health still held the belief that not the slightest proof had been furnished in Germany or in any foreign country to show that the origin of cancer is causally connected with the use of aluminum cooking vessels or that the growth of cancer can be in any wise facilitated by such use. This decision was based not only on statements of scientific journals but also on the results of its own animal experiments and observations on man. It was found that aluminum was not absorbed to the slightest extent by the digestive tract and was not taken up in any demonstrable quantities by the organism.

Schwartz, Cox, Unangst, Murphy and Wigman (*The Extent of the Retention of Ingested Aluminum, THE JOURNAL*, Nov 25, 1933, p 1722), in one of a series of papers on the hygienic aspects of aluminum cooking utensils, dealt with the extent to which aluminum is stored in the tissues under conditions of varied alimentary supply of soluble aluminum salts. The feeding of large amounts of soluble aluminum salts produces a barely detectable deposition of aluminum in the soft tissues (less than 0.5 part per million) and a somewhat larger amount (from 0.5 to 1 part per million in carcasses). The conclusion was arrived at that no harmful effects can be expected from soluble aluminum occurring naturally in foods or introduced by utensils into a diet of normal phosphorus content.

The Berlin letter in *THE JOURNAL* Nov 6, 1937, page 1555, mentioned an investigation undertaken by Dr Reif at the National Health Bureau to determine to what extent aluminum can supplant other metals used in the handling of food. Experiments were conducted with foodstuffs of an acid character, such as apple sauce and plum jam. Numerous experiments showed that the corrosive effect of these acid-containing foods on aluminum was particularly dependent on the water and extract content. Alloys of aluminum showed themselves the least resistant to the corrosive action of fruit products. Reif did not attempt any medical evaluation of the data. His report is interesting in the light of earlier studies also sponsored by the national bureau of health. It was concluded that no danger is entailed in the use of aluminum vessels.

Ivy, Terrey, Faunley and Bradley (*The Effect of Administration of Aluminum Preparations on the Secretory Activity and Gastric Acidity of the Normal Stomach, Am J Digest Dis & Nutrition* 3 879 [Feb] 1937) concluded that aluminum preparations such as aluminum hydroxide may be administered in relatively large doses to experimental animals without impairment to health. After prolonged administration of aluminum there appears to be an actual increase in the acid gastric-secretory response indicating a buffering action of the colloidal substance administered. The aluminum content of the livers of dogs was within normal limits, in human subjects, colloidal aluminum salts reduced the free acidity induced by an alcohol test meal for a period of forty-five minutes or longer.

The general opinion is expressed that the householders of the entire country need not look on aluminum utensils with undue apprehension in the ordinary course of preparing and cooking foods.

PREGNANCY TEST

To the Editor—Please give me information on a chemical test for early pregnancy which is put out by the Bio-Chemical Laboratories of Dayton, Ohio. In this test four chemicals are added to the urine and a precipitate results in positive cases. No animal injection is necessary according to the claims of the laboratory.

J L BROWNING MD Iron Mountain Mich

ANSWER—From a study of literature of the Bio-Chemical Laboratories on this chemical test for pregnancy it appears as though this company is putting out, as a secret formula, the chemicals used in the Bowman-Visscher test for pregnancy. Because further information about this product is not now available one must assume that the test is the Visscher-Bowman test or one of the modifications of this test as both tests use four chemicals, both tests are carried out by similar techniques, and in both, positive reactions consist of a reddish brown flocculent precipitate.

The technique as originally described is as follows:

To 1 cc of the urine to be tested, add (1) five drops of aqueous methyl cyanide solution, (2) one drop of 1 per cent

hydrogen peroxide, (3) five drops of phenylhydrazine hydrochloride and (4) five drops of concentrated hydrochloric acid. Heat for twenty-five minutes in a water bath. If positive for pregnancy, a reddish brown flocculent precipitate forms. If negative, the solution presents a straw yellow color. Further reports on this subject have been published by

Dolff Curt *Zentralbl f Gynaek* 59 2901 (Dec 7) 1935 abstr Brit Med J 1 38 (Feb 29) 1936
 Freth H C Jr *Am J Obst & Gynec* 33 854 (May) 1937
 Friedrich, Bernd *Monatsschr f Geburtsh u Gynaek* 103 211 (Oct) 1936
 Drabkin Charles and Goldschmidt S *Am J Obst & Gynec* 34 634 (Oct) 1937

Although many of the reports have been enthusiastic, it is felt that at present no chemical test for pregnancy can supplant the Aschheim-Zondek or Friedman test in accuracy.

MALDEVELOPMENT IN INFANT

To the Editor—Fourteen months ago I delivered a white male baby which weighed 7½ pounds (3400 Gm) at birth. The birth was a normal spontaneous delivery of two hours duration. The delivery was easy and the mother received no lacerations. The baby was considerably cyanosed; respiration was delayed in starting and the child did not cry out but only made facial grimaces with expulsive efforts. The respiratory passage was clear. The cyanosis cleared up in an hour. Examination of the baby revealed bilateral undescended testicles. The mother was a primipara aged 22 and had had no miscarriages. The pregnancy was normal in every respect. The pelvic measurements were normal. Four days before delivery she seemingly started into labor and had rather hard pains for twenty-four hours when her pains ceased. After labor apparently had stopped, I gave her oral sodium 5 grains (0.3 Gm) because she was tired and nervous. Rectal examination with pressure on the fundus of the uterus showed that the fetal head could be easily pushed into the pelvis. As a child the mother had infantile paralysis and was left with a paresis of the left lower extremity. Three years ago she developed a middle ear infection which resulted in a mastoidectomy. Both she and her husband are in excellent health physically and mentally and are Wassermann negative. There is no history of any familial disease or insanity. The baby was unable to nurse the breasts partly because the nipples were moderately retracted and also because it could not grasp well the nipple when it was everted. A cow's milk formula was substituted. It lost a pound but regained its birth weight in two weeks which it maintained for a month and then began to lose weight until at the end of another month it weighed 5½ pounds (2495 Gm). During this time the baby would not cry except on extreme stimulation and then it would only squeak and make facial grimaces. A study of the red blood cells revealed almost entirely nucleated corpuscles. I put the baby on a concentrated lactic acid milk formula. The baby at once began to gain weight and has continued to thrive well up to the present time. It now weighs 23 pounds (11 Kg). The baby never showed any inclination to crawl and at the present time it cannot stand. It has six teeth and eats a variety of foods. The turgor of the tissues is soft and there is considerable fat across the abdomen and in the thighs. The efforts at crying are the same. The facial expression is that of retarded mental development. The neck muscles are weak but the baby can hold its head up unsteadily. The eye muscles do not coordinate well. The hand grasp is not very strong. The arms and legs can be moved well voluntarily. The child is of a happy disposition. The testicles are still undescended. There is a scaly eczema on both cheeks. Elimination is good. A cold developed last winter and there is still a nasal discharge and cough despite efforts at treatment. The mother can place the baby on a bed and go about her housework and it will make no efforts to move around but it will amuse itself with its fingers and toes. At birth I thought that some intracranial hemorrhage had occurred but I could not satisfy myself that this was the case. After the blood study I considered the poor development to be due to an immature state of the blood-forming organs. At times the baby appears somewhat like a mongol. A Froelich's syndrome has recently been considered. Your discussion and advice will be greatly appreciated. M D Illinois

ANSWER—A 14 months old baby weighing 25 pounds (11 Kg) who cannot sit or stand must certainly be suffering from a considerable degree of mental retardation. It would be interesting to know whether the fontanels are closed and whether the head circumference is considerably less than the circumference of the chest. In other words, is this a microcephalic or a mongolian idiot? The hypotonicity and developmental lag might be symptomatic of cretinism. It might be well to roentgenograph the wrists and ascertain the number of epiphyseal centers that are present. Small doses of a thyroid gland preparation might be given as a therapeutic test. The great number of nucleated red blood cells which appeared at the end of the second month when the baby was 2 pounds under birth weight might have been due to the same cause that produced the marasmic condition. The appearance of nucleated cells could simply mean an intense regenerative effort on the part of the bone marrow. It is not stated whether the baby was anemic at this period. Erythroblastosis foetalis occurs in the new-born period. It is usually accompanied by a severe jaundice and a rapidly developing anemia. As these concomitant signs are not mentioned this condition was probably not present. An endocrine condition such as hypopituitarism is unlikely in such a young baby. Although there is apparently no spasticity,

the history of cyanosis at birth with inability to nurse a feeble cry would all point to a birth injury. The syndrome which this baby presents is not characteristic of any specific condition, and the diagnosis and prognosis will probably become clearer as the development of the infant progresses.

EDEMA ON DORSUM OF PENIS

To the Editor—A man aged 45, married and in perfectly good health consulted me because of a localized edema on the dorsum of the penis. The area involved is about the size of a half dollar (30 mm) and is sharply circumscribed. The edema disappears entirely each night at 11 o'clock and increases steadily from morning to night. There is no pain. Physical examination including laboratory reports revealed no abnormality. A thorough examination of the urethra, bladder and prostate by complete genito-urinary specialists failed to locate any pathologic condition that might be responsible. There is no inguinal adenitis. Apparently the edema is due to lymphatic obstruction. Can you suggest a possible etiologic factor? I have felt that angioneurotic edema need not be seriously considered, because of the total disappearance of the edema with change in posture. The wearing of a suspensory bandage with a support which holds the penis up prevents the edema completely but the moment that this device is discarded there is a recurrence. Your comments and suggestions will be greatly appreciated. M D Missouri

ANSWER—Lesions such as that described must be extremely rare since on inquiry among several urologists of wide experience no similar condition has been observed. The disappearance of the area involved each night and when supported with a suspensory bandage would indicate a circulatory disturbance. Lymphatic obstruction does not disappear on change of position. However, it is difficult to see how obstruction to the venous backflow could be circumscribed to so small an area. It is apparently caused by some mechanical factor and any intervention would necessarily have to be surgical. It is open to question however, whether an operation would be indicated in view of the fact that it causes the patient little or no inconvenience and it should be of no future consequence. If the patient insists on something being done, excision of this area might be tried if the circulation in the surrounding tissue is satisfactory. A more rational course, however, would be to leave it alone.

NASAL POLYPS AFTER TRAUMA

To the Editor—Last May a man engaged in a fight with the territorial marshal. The man was not examined by a doctor either before or after the fight. However, September 26 he asked me to examine his nose and I found a septum deviated to both sides and multiple polypi in both nostrils. He was seen by an otolaryngologist who operated on him confirming the diagnosis. The man is now bringing suit against the marshal stating that during the fight he was struck on the nose thus causing the condition for which he was operated on. Granted that he was hit on the nose would it be possible for four or five large polypi to develop in each nostril four months later? Is it more likely that these polypi were already present at the time and the injury only aggravated the condition as it was more noticeable after the fight? The patient claims he never had trouble with his nose until after the injury. M D Utah

ANSWER—Whatever statements can be made relative to this case can only be in the nature of opinion rather than of fact. The chances that a blow on the nose would produce multiple polypi in both nostrils are exceedingly remote. Multiple polypi are, as a rule, seen in the presence of an allergic rhinitis and less often following an infection of the ethmoid or antrum. A septum could be fractured and badly bent as a result of a fight, but there should be a history of nosebleed, swelling and discoloration about the eyes after an affair of this nature. It is most likely, therefore, that the polypi, whether they were present at the time or occurred after the fight, bear no relationship to it.

HYPERTERMIA IN GONORRHEAL ARTHRITIS

To the Editor—Please send me information on the safest form of fever therapy for the treatment of gonorrheal arthritis. 1. Would it be contraindicated in a patient who was overcome by heat many years ago? 2. Would it be contraindicated in a patient whose pulse usually has been 120 even when he had no fever and in the absence of other evidence of endocarditis? 3. Could fever therapy be carried out satisfactorily by immersion in a bath tub? M D Wisconsin

ANSWER—1. Fever therapy would not be contraindicated in a patient previously overcome by heat.
 2. A pulse of 120 in a young or middle aged person with evidence of cardiac disease or endocarditis is of itself a contraindication to fever therapy. In an instance of this kind one would be guided by the pulse rate as the fever increased.
 3. Fever therapy aimed at killing the gonococci would be somewhat hazardous if one attempted to carry it out by immersion in a bath tub.
 The employment of fever therapy in the treatment of gonococcal infections was adequately reviewed in THE JOURNAL.

May 18, 1935, page 1779, and Oct 30, 1937, page 1430 This type of therapy should not be entered into lightly by either the physician or the patient because it represents a major therapeutic procedure the complications of which may be serious and at times fatal Probably the best form of fever therapy to employ for routine purposes is that of intravenous injections of typhoid vaccine

BURNING TONGUE WITH HOT FOOD

To the Editor—A woman aged 39 has a past history of an operation for carcinoma of the breast seven years ago Since August 1936 she has on eight occasions burned her tongue with hot food On each occasion she was aware that the food was hot but was surprised a few hours later to find her tongue sore and showing a small reddish area not an ulceration which responded to a few applications of silver nitrate Why is the tongue so susceptible to injury from mild heat? The blood and gastric contents are normal Would you suggest anything with regard to this phenomenon and any treatment? RICHARD H LYON MD, Seattle

ANSWER—Ordinarily the mucous membrane of the mouth is much more tolerant of heat than is the skin Cases are known, however that are more than normally susceptible to heat According to W W Duke (Physical Allergy THE JOURNAL, March 7, 1925, p 736) heat sensitiveness is the commonest form of physical allergy Most of the patients have a sub-normal temperature and when the temperature is brought up to normal they lose their sensitiveness to heat No report has been found of any such sharply localized reactions as the patches mentioned nor do these heat reactions persist They are easily dissipated by cooling applications

Paralyzed parts are known to be more than normally susceptible to heat and to burn at temperatures too low to burn normal skin This evidently does not apply to the patient under discussion

It is possible that these reddened patches are not burns but irritations of the nature of canker sores that by coincidence occurred at the time hot food was eaten

Experimental proof of the claim that the patient's tongue can be burned by temperature too low to burn normal mucous membrane would be convincing If proof can be supplied the case should be carefully studied and reported

No suggestions for treatment can be made until the diagnosis is settled Until then the patient should avoid hot foods

CONCENTRATION OF INTRAVENOUS DEXTROSE SOLUTION

To the Editor—Recently in the treatment of a case of cardiovascular renal system disease (atherosclerosis with coronary thrombosis vascular nephritis and true uremia) as consultant I suggested the use of a concentrated solution of dextrose 50 cc of a 50 per cent solution intravenously The attending physician seriously objected on the ground that this would thrombose the veins so that further medication in the veins would be difficult or impossible M D Alabama

ANSWER—Fifty per cent solution of dextrose may produce a thrombosis in the antecubital vein, used by the drip method and with flushing of the vein after the injection is completed the incidence of thrombosis cannot be high Should the administration of such strongly hypertonic solutions be important as for purposes of dehydration, one can take the small risk of plugging the vein In the case described however a 20 per cent dextrose solution would be equally useful, if given with the idea of promoting diuresis and improving the nutrition of the myocardium

POSSIBLE ACRODYNIA

To the Editor—Is there anything new in the treatment of acrodynia in a 15 months old child besides ampules of vitamin B liver extract wine sulfamidate calcium cod liver oil whole blood potassium iodide high vitamin diet and yeast tablets? A patient has had it from April 1 1937 the right lower teeth have sloughed out and a condition of the mucous membrane of the mouth somewhat like noma appeared at the same time Now the right eye has developed corneal ulcers with keratitis and subsequent loss of sight in the eye The patient has lost 11 pounds (5 kg) Consultations were held with competent pediatricians and eye men H M JUERGENS MD Belle Plume Minn

ANSWER—The data supplied in this inquiry are hardly specific enough The question of the correct diagnosis immediately arises Is the child febrile or afebrile? What is the condition of the skin? Has the child had a typical anorexia, excessive perspiration, itching and burning, listlessness irritability and the rash of an acrodynia? Does the child suffer from insomnia? Was there photophobia or tachycardia?

In a recent article on the subject of acrodynia, J B Bilderback (Brennemann's Pediatrics, volume 4) reviews the literature on the subject with regard to the pathology Lesions of the nervous system in this condition appear to be an organic

disorder of the vegetative nervous system Changes in the peripheral nerves are thought to be secondary and trophic There is no mention of corneal ulceration, keratitis or loss of sight in any of the pathologic reports of this condition or in reports on the symptomatology

It is true that one of the most dramatic occurrences in acrodynia is the loss of teeth However, the mucous membrane of the mouth, while it may assume a slight redness, is never spongy or swollen, unless after loss of the teeth, a secondary infection occurs It may be suggested that the case be reviewed in the light of the diagnosis and a blood culture made to rule out any infectious etiology of a septic nature

LATE TREATMENT OF BURNS

To the Editor—A boy aged 4½ years was playing with matches April 2 1936 His clothes caught fire and he received a second degree burn of the left leg extending from the heel to the inguinal region and involving the entire leg with the exception of an area of about 2 inches in the popliteal space under the knee I was called to see the child April 10 and found the leg badly infected I have been treating him since that time with good results except for two points There is an area of about 1½ inch and a half in diameter below the knee joint and on the outer side of the leg that has remained stationary for the last two months Although it is covered with healthy granulation no matter what I tried was of no avail If I keep the wound bandaged and covered it spreads and if I leave it open it is stationary Is there anything that you can suggest that I may do to hasten the healing of that spot? The area in the popliteal space with the normal skin was a godsend as it prevented contracture of the knee joint but in healing on the outer surface of the knee there is a thick scar which prevents complete extension and the child keeps the leg flexed at an angle of about 10 degrees Should I leave the child alone hoping that eventually it will straighten out as the child is active? Shall I put him under an anesthetic and stretch the leg or have the scar cut out and have it skin grafted? M D New York

ANSWER—Granulating wounds that do not heal for long periods are as a rule best treated by skin grafting In order to prepare the area properly for grafting it is necessary to control infection and exuberant granulations Exuberant granulations can best be controlled by means of pressure dressings These dressings are made by applying to the wound fine mesh gauze (40 by 44) covered with a sea sponge, over which an Ace bandage is applied When the area appears to be in satisfactory condition for the application of grafts, either the split skin grafts may be applied according to the method described by Blair or small deep grafts may be applied after the method of John Stage Davis It is not advisable to allow granulating wounds to remain unhealed indefinitely Scarring which prevents complete extension and keeps the leg flexed at an angle of 10 degrees is best treated by excision or division of the scar, the resulting defect being covered with skin, either by plastic flaps or by skin grafts

GALLSTONE IN YOUNG GIRL

To the Editor—A girl aged 12 years has had repeated attacks of pain in the upper right quadrant of the abdomen colicky in nature Flat roentgenograms have been taken and also gallbladder dye by mouth given which show that this patient has a definite stone in the gallbladder According to the dye test the gallbladder functions properly The patient for the past several weeks has had a definite hard attack at least once a week This is my first experience in gallstones at this age If the patient continues to have these attacks do you think a cholecystectomy is indicated and what will be the after effects if any? M D, North Carolina

ANSWER—In this type of case it would seem that there is a definite indication to remove the stone and leave the functioning gallbladder in place A cholecystectomy is not indicated but rather a cholecystotomy with removal of the stone The gallbladder wound should be closed by an inversion suture and the abdomen drained by a cigaret drain placed beside the gallbladder The drain should be removed in seven or eight days

EXPLOSION OF ARTIFICIAL EYE

To the Editor—Please send me information regarding the following statement Incidence of explosion without apparent cause of artificial eyes while being worn HUGH J BAKER MD Hamilton Ohio

ANSWER—From time to time there appears in the literature the account of an explosion of an artificial eye without apparent cause, while being worn All in all, less than a dozen such incidents have been reported It is believed such explosions result from the sudden admission of air to the interior of the eye In the process of manufacture the air within the shell of the prosthesis is expelled by the heat to which the glass is subjected while being formed Ordinarily, the vacuum thus produced is maintained but in some persons there is enough secretion from the socket to cause a gradual erosion of the shell The erosion may hit a thin spot in the shell and when the external air pressure is greater than the strength and

resistance of the glass at this area, the wall of the shell is forcibly ruptured. Usually there is no explosion, but under certain conditions that are not fully understood the sudden advent of the air under ordinary atmospheric pressure is sufficient to cause the explosion.

PITTING OF FINGER NAILS

To the Editor—A patient has finger nails with large pits near the center and rather deep indentations toward the tips of the nail which persist in spite of the continued growth of the nails. Treatment of one nail with various remedies including sodium thiosulfate moistening the nail with tincture of green soap calomel ointment and mercury bichloride solution apparently checked the condition but it soon began to pit again near the base. Scrapings of the nails failed to show any fungi. I would appreciate any suggestions you might have as to diagnosis and treatment.

L. E. SKINNER MD Tacoma Wash

ANSWER—The diagnosis of nail deformities not accompanied by evidence of local infection or of disease elsewhere in the body is largely limited to descriptive terms, such as onychia punctata, pitted nails. This condition is seen most often with psoriasis, less frequently with eczema of the nail folds, dermatitis herpetiformis and syphilis, and rarely with lichen planus. It is impossible to make a diagnosis of any of these conditions from the nails alone. Search should be made for skin lesions.

Direct examination of scrapings is not sufficient to rule out fungous infection. Cultures should be made on sugar mediums. Such infections usually begin on one or a few nails and slowly involve others.

Lacking a diagnosis, treatment can consist only of general supportive treatment of the patient and care to see that the nail folds are not allowed to become too dry. Application of an ointment, preferably containing wool fat should be made every evening.

EFFECT OF ATTEMPTED ABORTION ON FETUS

To the Editor—A woman aged 26 married has had two normal deliveries and has used a great number of medicines in an attempt to induce an abortion. At about the second month of pregnancy a number (from twelve to fifteen) of patent emmenagogue tablets were used. This was followed by hypodermic administration of some ergot preparation and this was followed by castor oil and quinine. Several weeks later she received four or five injections of some new pituitary substance (pitocin as near as I could determine) this being preceded by castor oil. All this therapy has been unavailing. The patient is now convinced that she should continue with her pregnancy but is gravely concerned as to whether or not there might be any malformations of the baby. At no time during her siege of treatment did she have any cramps (uterine) or bleeding. I would appreciate your opinion as to whether or not any disturbances of development are to be expected in such a case.

M. D. Michigan

ANSWER—It is now generally believed that fetal malformations are the result of defects in the germ cells and do not result from the environmental conditions in utero. Furthermore, most of the malformations begin very early in the course of embryonic development. Probably in this case the embryo would have been on its way to normal or abnormal development before the drugs were taken. It might be possible for the woman to be delivered of an abnormal fetus, but such a chance would probably not be greater than if she had not taken the oxytocic drugs. She might have killed the embryo but probably did not, as an abortion would have resulted by this time though an embryonic death and missed abortion might be a possibility. In short, she need not worry about a malformation occurring as the result of her self medication.

ELLIOTT TREATMENT FOR PROSTATITIS

To the Editor—I have noticed in Queries and Minor Notes frequent references to prostatic hypertrophies or infections but at no time—and this has been rather a surprise to me—has there been any reference made to treatment with the Elliott method by the prostatic applicator. After considerable experience with these conditions and with this type of treatment my results have been far superior both from a clinical and from a laboratory standpoint to those with the old type of massage.

GEORGE A. PRATT MD Menasha Wis

ANSWER—The use of heat by many methods of application in the treatment of various urogenital conditions extends back over many years. It is true that some recent work suggests helpful advances in the therapy of simple chronic prostatitis, simple urethritis in the female, specific prostatitis and seminal vesiculitis with the Elliott technic. Lasting and satisfactory benefit with this method in prostatic hyperplasia remains to be demonstrated clinically. The recent report of Kenner (*Illinois M J* 71:248 [March] 1937) offering favorable comment on prostatic heat application especially in specific prostatic infection suggests that the possibilities of this method might justify extended research.

RHEUMATIC OR SEPTIC ENDOCARDITIS

To the Editor—A boy aged 12 was sent home from a hospital at Chattanooga with the diagnosis of septic endocarditis following rheumatic fever. I believe that this is only partially correct as he has a distinct valvular lesion and the apex beat is heard loudest in the postaxillary line and more faintly in front and back. Consequently my diagnosis is myocarditis with involvement of one or both valves of the heart. I present him as free of fever but is kept continually in bed on heavy diet of sodium salicylate and liver extract intramuscularly once weekly, a liberal diet and thorough elimination. Is this all that can be done for the boy? I would also appreciate a prognosis.

WILLIAM A. BREWER MD Monticello Tex

ANSWER—Active bacterial endocarditis is rare in the absence of fever. Evidence of valve lesions is not incompatible with active endocarditis. Repeated blood cultures with the growth of the organism should give adequate proof of the presence of a bacterial endocarditis. The treatment if endocarditis is present is not apt to be successful. It should consist of bed rest, careful and adequate feeding and the use of salicylates for fever. Arsenic in the form of sodium cacodylate has been reported to be of value. If there is no proof of an active endocarditis, the treatment should be that of an inactive rheumatic heart disease with valve damage. This consists largely of rest and graduated activity, with salicylates for pain or fever and digitals if indicated for cardiac failure.

GNORRHFA

To the Editor—A man aged 40 has had a gonococcal infection of about four weeks duration and is at a loss to know where he became infected. He admits contact about ten days prior to the beginning of the discharge. However the contact has had no clinical symptoms and smears from the urethra, vagina and cervix were negative. Other than this the patient states that there was no exposure. He admits an infection about twenty years ago which was apparently cured. About six years ago he contemplated marriage and several smears were taken by a genito-urinary specialist who pronounced him free from infection. I am curious to know whether in your opinion it has been possible for him to have a latent infection of twenty years duration with no symptoms. It states that on one or two occasions during the past two years he has had a clear mucous morning discharge small in amount.

ANSWER—Since gonococcal infections of the urethra are acquired by contact with one already infected, the source of this man's infection probably is known to him. The person whom he suspects has had no symptoms and all smears were negative for gonococcal infection. Cultures, done properly at times demonstrate gonococci when smears are negative. It is highly improbable that this man harbored the gonococcus twenty years without evidence symptomatically of its presence. He has a recent infection and should not come in contact in the future with any one with whom he has consorted in the past few weeks.

ALUMINUM HYDROXIDE AND ALKALIS IN PEPTIC ULCER

To the Editor—Please give the relative value of aluminum hydroxide and alkalis in the treatment of gastric ulcer and gastric hyperacidity.

J. S. DEALLE MD Holt Ala

ANSWER—Aluminum hydroxide has a number of advantages over alkalis in treatment of peptic ulcer. In the first place it is not likely to produce alkalosis. It has a good combining power but does not liberate carbon dioxide, as do the carbonates, and it is not laxative, like the magnesium salts. Colloidal aluminum hydroxide is on the market under various names; not all the products are satisfactory adsorbents. In some cases the product is given half an hour before meals as well as after meals. Its use before meals, especially when combined with a small dose of belladonna seems to control the amount of free acid available in the stomach when food is taken.

TREATMENT OF CHRONIC ALCOHOLISM

To the Editor—Is there any new proved treatment for chronic alcoholism or any treatment to top the craving for alcohol?

A. G. YOUNG MD Wenatchee Wash

ANSWER—There are several factors in addition to alcoholic beverages. One of these is the psychic factor, alcohol being used as a retreat from a painful reality. Another factor is brought out by Tatum and Seever (Theories of Drug Addiction, *Physiol Rev* 11:107 [April] 1931) that alcoholic habituation may resemble morphinism in that an increased nervous irritability is produced by the use of the drug and that it craves more of the drug so that its depressant action may be about an approach to normal. This theory finds support in the work of Cloetta, Langer Schmidt and Livingston, and Hirschclaff (quoted by Tatum) that cells become more sensitive to the presence and responsive to the absence of the drug.

Medical Examinations and Licensure

COMING EXAMINATIONS				
STATE AND TERRITORIAL BOARDS				
ALABAMA	Montgomery	June 28	Sec Dr J N Baker	519 Dexter Ave Montgomery
ALASKA	Juneau	March 1	Sec Dr W W Council	Box 561 Juneau
ARKANSAS	Medical (Regular)	Little Rock	June 21 22	Sec State Medical Board of the Arkansas Medical Society Dr L J Kosminsky
TEXARKANA	Medical (Ecclectic)	Little Rock	June 21	Sec Dr Clarence H Young 1415 Mun St Little Rock
CALIFORNIA	Reciprocity	Los Angeles	Feb 23	San Francisco May 11 Los Angeles July 11 San Francisco, Sept 14 and Los Angeles Nov 16
WRITTEN EXAMINATIONS	Los Angeles	March 7 10	San Francisco June 27 30	Los Angeles July 11 14 and Sacramento Oct 17 20
DR CHARLES B PINKHAM	420 State Office Bldg	Sacramento		
CONNECTICUT	Basic Science	New Haven	Feb 12	Prerequisite to license examination Address State Board of Healing Arts 1895 Yale Station New Haven
MEDICAL (REGULAR)	Hartford	March 8 9		
ENDORSEMENT	Hartford	March 22	Sec Dr Thomas P Murdock	147 W Main St Meriden
MEDICAL (HOMOEOPATHIC)	Derby	March 8	Sec Dr Joseph H Evans	1488 Chapel St New Haven
DELAWARE	Dover	July 12 14	Sec Medical Council of Delaware	Dr Joseph S McDaniel 229 S State St Dover
DISTRICT OF COLUMBIA	Basic Science	Washington	June 27 28	Asst Sec Commission on Licensure Mr Paul Foley 203 District Bldg Washington
FLORIDA	Jacksonville	June 13 14	Sec Dr William M Rowlett	Box 786 Tampa
GEORGIA	Atlanta	June	Joint Sec State Examining Boards Mr R C Coleman	111 State Capitol Atlanta
IDAHO	Boise	April 5 6	Commissioner of Law Enforcement Hon J L Balderston	205 State Capitol Bldg Boise
ILLINOIS	Chicago	Jun 25 27 April 5 7	June 28 July 1 and Oct 18 20	Superintendent of Registration Department of Registration and Education Mr Homer I Byrd Springfield
INDIANA	Indianapolis	June 21 23	Sec Board of Medical Registration and Examination Dr J W Bowers	301 State House Indianapolis
KANSAS	Topeka	June 21 22	Sec Board of Medical Registration and Examination Dr J F Hassig	905 N 7th St Kansas City
KENTUCKY	Louisville	June 8 10	Sec State Board of Health Dr A T McCormack	620 S 3rd St Louisville
MAINE	Portland	March 8 9	Sec Board of Registration of Medicine Dr Adam P Leighton	192 State Street Portland
MARYLAND	Medical (Regular)	Baltimore	June 21 24	Sec Dr John T O'Mara 1215 Cathedral St Baltimore
MEDICAL (HOMOEOPATHIC)	Baltimore	June 21 22	Sec Dr John A Evans	612 W 40th St Baltimore
MASSACHUSETTS	Boston	March 8 10	Sec Board of Registration in Medicine Dr Stephen Rushmore	413 F State House Boston
MICHIGAN	Ann Arbor and Detroit	June 15 17	Sec Board of Registration in Medicine Dr J Earl McIntyre	202 3 4 Hollister Bldg Lansing
MISSISSIPPI	Jackson	June	Asst Sec State Board of Health Dr R A Whitfield	Jackson
MONTANA	Helena	April 5 6	Sec Dr S A Cooney	205 Power Block Helena
NEVADA	Reciprocity	Carson City	Feb 7	Sec Dr John E Worden Capitol Bldg Carson City
NEW HAMPSHIRE	Concord	March 10 11	Sec Board of Registration in Medicine Dr Fred E Clow	State House Concord
NEW JERSEY	Trenton	June 21 22	Sec Dr James J McGuire	28 W State St Trenton
NEW MEXICO	Santa Fe	April 11 12	Sec Dr Le Grand Ward	135 Sena Plaza Santa Fe
NEW YORK	Albany	Buffalo New York and Syracuse	Jan 24 27 June 27 30 and Sept 19 22	Chief Professional Examinations Bureau Mr Herbert J Hamilton 315 Education Bldg Albany
NORTH CAROLINA	Raleigh	June 13	Sec Dr B J Lawrence	505 Professional Bldg Raleigh
OKLAHOMA	Basic Science	Oklahoma City	May 4	Sec of State Hon Frank C Carter State Capitol Bldg Oklahoma City
MEDICAL	Oklahoma City	June 8 9	Sec Dr James D Osborn Jr Frederick	
OREGON	Basic Science	Portland	March 19	Corvallis July 16 and Portland Nov 19
Sec State Board of Higher Education	Mr Charles D Byrne	University of Oregon	Eugene	
PUERTO RICO	Santurce	March 1	Sec Dr O Costa	Mandry Box 536 San Juan
TEXAS	San Antonio	June 20 22	Sec Dr T J Crowe	918 Mercantile Bldg Dallas
VERMONT	Burlington	Feb 8	Sec Board of Medical Registration	Dr W Scott Ray Underhill
VIRGINIA	Richmond	June 22 24	Sec Dr I W Preston	307 Franklin Road Roanoke
WEST VIRGINIA	Huntington	March 21 23	Sec Public Health Council Dr Arthur E McClue	State Capitol Charleston
WISCONSIN	Basic Science	Madison	April 2	Sec Prof Robert N Baker 3414 W Wisconsin Ave Milwaukee
WYOMING	Cheyenne	Feb 7	Sec Dr G M Anderson	Capitol Bldg Cheyenne

NATIONAL BOARD OF MEDICAL EXAMINERS
SPECIAL BOARDS
Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL January 15 page 231

West Virginia November Report
Dr Arthur E McClue secretary West Virginia Public Health Council, reports the written examination held at Charleston Nov 8-10 1937 The examination covered 10 subjects and included 100 questions Ten candidates were examined, all of whom passed Sixteen physicians were licensed

by reciprocity and two physicians were licensed by endorsement The following schools were represented

School	PASSED	Year Grad	Per Cent
George Washington University School of Medicine	(1936)		89 3
Emory University School of Medicine	(1936)		85 4
University of Kansas School of Medicine	(1935)		86 7
University of Louisville School of Medicine	(1936)		82 6
New York University University and Bellevue Hospital Medical College	(1931)		89 4
Jefferson Medical College of Philadelphia	(1935) 91 5	(1936)	88 2
Meharry Medical College	(1932)		80 2
Medical College of Virginia	(1936)	83 7	86 5
School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
George Washington University School of Medicine	(1911)	Dist Colum	
Indiana University School of Medicine	(1936)	Indiana	
Louisville and Hospital Medical College	(1908)	Indiana	
University of Louisville Medical Department	(1920)	(1921)	Kentucky
University of Louisville School of Medicine	(1927)	(1936 3)	Kentucky
University of Maryland School of Medicine and College of Physicians and Surgeons	(1935)	(1936)	Maryland
University of Cincinnati College of Medicine	(1930)	(1936)	Ohio
Western Reserve University School of Medicine	(1931)	(1931)	Ohio
Medical College of Virginia	(1927)	(1936)	Virginia
School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Northwestern University Medical School	(1933)	N B M E	N
University of Tennessee College of Medicine	(1934)	N B M E	N

Book Notices

Drug Addiction By E W Adams OBE MD A Medical Officer of the Ministry of Health Cloth Price \$3 Pp 173 New York & London Oxford University Press 1937

The book is important because it is the only one available today that has a synopsis of all the different theories of the mechanism of tolerance and the abstinence syndrome with the many different methods of treatments advocated The author has made an extensive review of the world's literature on drug addiction with the object of condensing the information of this important unsolved problem in a concise, available form About 250 articles are listed in the bibliography, many of them not usually accessible to the general practitioner Principal attention has been given to the practical aspects of addiction, with the result that it is a smaller and more incomplete work than the book of Terry and Pellen on "The Opium Problem" published in 1928 The author has no preconceived theoretical ideas and is not pledged to any particular view or method and his comments are sound However, in his opening chapter on 'What is Addiction?' he devotes several pages, with little success in an attempt to coin a new definition for the word 'addiction' He evidently, in his review, overlooked Tatum, Seever and Collins's clean cut definitions with a distinction between words "addiction" and 'habituatioin,' which have been extensively adopted in the recent literature on this subject

The next seven chapters on classification, history, epidemiology of addiction—prevalence and incidence, etiologic considerations, diagnosis and symptomatology, the addict himself, the drug and the method are well done but have little really new information He ends the last chapter with a discussion of 'tea addiction in Tunis and Egypt, where the ordinary infusion is not used but a quintuple brew in which the tea is reduced by boiling to a black liquid consisting of a poisonous extract of tannin and theme with the result that the devoted users neglect food, sleep and work in pursuance of their mania

In the ninth chapter on the mechanism of tolerance and the abstinence syndrome, the following theories of tolerance invoking biochemical disturbances are given and discussed theories of neutralization active immunity, destruction, cellular tolerance muscle-storage lecithin cholium and the 'pathobiotic theory of Weger and Amsler Theories that invoke physiologic disturbances are the stimulation depression theory and the autonomic and endocrine imbalance theories The author also lists theories in explanation of the withdrawal symptoms the theory of toxins, of release of tissue hydration, of exodic stimulation of endocrine hypofunction, of psychosis of stimulation depression and of anaphylaxis Then he says that from all this it is obvious that the problem of tolerance and the abstinence syndrome do not yet admit of a complete solution and when considered in detail they fail to convince and lack adequate experimental support, that the psychic element must not be ignored though it cannot be held the sole factor that much light has been shed on the nature of the withdrawal

symptoms, and that Kolb's (1936) dictum that "nothing is known about the fundamental mechanism of drug addiction" is certainly too pessimistic.

The author states that a careful study of the recorded evidence shows that, on the whole, the prognosis of addiction is not merely serious; it is definitely bad. That "it is remarkable that those who employ the older methods are very conservative in their estimates, while the originators of new treatments are in the front rank of optimists. Perhaps when the newer procedures have endured the mellowing effect of time the enthusiasm of their sponsors will become mellowed also. Too often the results reported merely mean that denarcotization has been successfully carried out. For it must never be forgotten that the difficulties inherent in withdrawal are as nothing compared with those encountered in rehabilitation. Yet it is highly improper to speak of 'cure' unless rehabilitation has been encompassed, for relapse is the rule and not the exception."

Under treatment he discusses the ambulatory method, withdrawal methods involving a strictly limited period, under which he considers (1) abrupt or sudden withdrawal methods covering abrupt withdrawal pure and simple ("cold turkey" treatment), abrupt withdrawal under hypnosis, abrupt withdrawal assisted by drugs of the atropine series, abrupt withdrawal combined with "specific" treatment (narcosan, rossium), abrupt withdrawal with symptomatic treatment assisted by certain drugs such as insulin and theophylline with ethylenediamine, (2) rapid withdrawal methods by the aid of injections of autogenous blood or serum (e.g., the blister serum method of Modinos), Ma's lecithin method, with accessory treatment by endocrine preparations, with the assistance of drugs of the opium series such as codeine and other methods of rapid withdrawal, with the help of drugs of the atropine series, under light anesthesia, combined with administration of certain synthetic drugs, the calcium therapy method of Amsler, and (3) the gradual withdrawal method. He also discusses the "conditioned reflex" method of treatment.

Adams commends the way the United States is attempting a solution and the research being done at the Universities of Virginia and Michigan.

Operative Surgery [Volume III]. The Ear, Air Passages and Neck. By Dr. Martin Kirschner, Ordinarius Professor of Surgery and Director of the Surgical Clinic at the University of Tübingen (Germany). With the collaboration of A. Lautenschlager and Dr. O. Kleinschmidt. Authorized translation by I. S. Ravdin, B.S., M.D., Harrison Professor of Surgery, University of Pennsylvania, Philadelphia, and George M. Coates, A.B., M.D., Professor of Otolaryngology, Medical School, University of Pennsylvania, Philadelphia. Cloth, Price \$12. Pp. 728 with 460 illustrations. Philadelphia: C. London. J. B. Lippincott Company, 1937.

Perhaps the most impressive features of this volume are the excellent character of the illustrations and the clear concise manner in which the text material has been arranged and presented. Not only is the work in the individual illustrations of excellent quality, but the illustrations are so well chosen that the various steps in the operative procedures are clearly depicted. Accurate descriptions of the anatomy precede consideration of the actual operative technique. In addition, there is found a short discussion of etiologic factors and clinical manifestations which serve to complete the picture for the reader and clarify the portion of text confined to operative technique. Even though the space devoted to the discussion of nonoperative details is necessarily limited, it contains innumerable important clinical features, many of which are not generally appreciated. Calling attention to the fact that many of the lateral cervical cysts do not arise from branchial clefts but from the thyropharyngeal duct is an example of these many helpful clinical notes. In general, omission of important data pertaining to the text is uncommon, but failure to discuss such popular procedures as scalenotomy in the treatment of cervical ribs and the use of ethylene and cyclopropane as anesthetics in thyroid surgery might be considered by many surgeons as detracting features, even though the author may not believe in them as accepted procedures. The importance of the innumerable comments of the American authors cannot be overemphasized because so often they temper or modify statements which, to the American surgeon at least, would be considered as frankly inaccurate or too dogmatic. Gross inaccuracies in extending credit to the proper sources (particularly English and American) is likewise prevented by these comments. The portion of the volume devoted to consideration of toxic goiter

(from the operative and nonoperative standpoints) is perhaps the weakest part of the book. It is here that the comments of the American editors are most valuable. Considered as a whole, however, the book should receive only favorable comments particularly because of the clarity of presentation. It should be very valuable to the general practitioner as well as to the specialist. The publishers are likewise to be commended for their splendid choice of type and paper used in the book as well as for the excellence of reproduction of illustrations.

Epitome of the Pharmacopoeia of the United States and the National Formulary with Comments. Corrected and Revised in Accordance with the First Supplement of the Pharmacopoeia, Eleventh Revision and the First and Second Correction Lists of the National Formulary, Sixth Edition. Prepared for the Use of Physicians Under Authorization of the Council on Pharmacy and Chemistry of the American Medical Association by a Committee of Council Members: Robert A. Hatcher, Pharm.D., Chairman of the Committee; Ernest E. Irons, Ph.D., M.D., Clinical Professor of Medicine and Chairman of the Department of Medicine, Pritzker Medical College, University of Chicago; Torald Sollmann, M.D., Professor of Pharmacology and Materia Medica, and Dean, School of Medicine, Western Reserve University; and Paul Nicholas Leech, Pharm.D., Secretary of the Council on Pharmacy and Chemistry. Fifth edition, revised. Cloth. Price 60 cents. Pp. 244. Chicago: American Medical Association, 1937.

This Epitome was prepared under the direction of a committee appointed by the Council on Pharmacy and Chemistry to give physicians, in brief form, information about drugs and preparations included in the Pharmacopoeia and the National Formulary. This edition differs from the preceding edition as far as the individual items are concerned; it includes only articles which are in the new eleventh revision of the Pharmacopoeia and the new sixth edition of the National Formulary, together with some items, and corrections and changes found in the first supplement to the eleventh edition of the U.S.P., and the first and second correction lists for the National Formulary. While the first supplement contains complete monographs for seventy-nine preparations, all but one of which replace certain monographs in the eleventh edition of the U.S.P., only twenty-one of these monographs contain changes which affect the statements in the fifth edition of the Epitome, and these changes consist principally of corrections in the spelling of names in the Latin endings, in the percentages of active ingredients and changes in the percentages of alcoholic content.

The corrections listed in the two official correction lists which have been issued for the sixth edition of the National Formulary are largely typographical; they too have been entered in this revision of the Epitome.

Qualitative Analysis by Spot Tests. Inorganic and Organic Applications. By Fritz Feigl, Ph.D., Professor of Analytical Chemistry, University of Vienna. Translated from the latest German edition by Janet W. Matthews, Ph.D., F.I.C., Imperial College of Science and Technology, London. Cloth. Price \$7. Pp. 400 with 24 illustrations. New York: Nordemann Publishing Company, Inc., 1937.

Modern biochemistry owes its results to the achievements of those men who made it a life's calling to work with material of such limited amount that it caused the development of analytical methods previously unknown. Pregl, the eye surgeon and physiologic chemist whose prime interest was directed toward sterol chemistry long before hormones became by word and deed the organic micro analysis. Behrens, Emich, Molisch and the American Chamot laid the foundation for inorganic micro-analytic procedures. However, biologic research is more and more concerned with the determination of biologically active substances present in the living organism in infinitely small amounts. It remained for Fritz Feigl to present to the scientific worker a reference book for the qualitative analysis of the smallest amounts by his "spot tests." Janet W. Matthews must be congratulated for the difficult task of translating a technical book which in its original is difficult reading even for those acquainted with German. Unfortunately, the English translation of the German text is not complete because it concerns itself only with the second part of Feigl's recent German edition, namely the practical aspect of spot test analysis. There is no doubt as to the need for translation of this theoretical part so marvelously presented in the German original text because it is this part which makes Feigl's edition so valuable to the German speaking research chemist. The rationalization of chemical work and the specially designed apparatus for spot analysis, together with

the economy of time, material, space and labor, make this micro method called "spot analysis" one of the most useful tools in the laboratory. The translation of Feigl's book provides the English speaking scientist with a reference book of utmost value, indispensable for clinical, biologic, biochemical and numerous other laboratories. The methods are well described, the literature abreast of the times, and in each instance limitations and interference of other elements duly emphasized. The English speaking workers who are already using Feigl's method would appreciate an edition of the theoretical aspects of "spot analysis."

Short Wave Diathermy By Tibor de Cholnoky Associate in Surgery New York Post Graduate Medical School Columbia University Cloth Price \$4 Pp 310 with 38 illustrations New York Columbia University Press 1937

Written with the conviction that short wave diathermy has a definite usefulness in medical practice both as a specialty and as an adjunct to more classic methods of treatment, this book appears to have a twofold aim. In addition to presenting a survey of the laboratory and clinical investigations concerning the application and effects of high frequency currents made in this field to date, the author hopes to stimulate continued and more standardized research on the value of this agent. There are a number of factors which make it difficult to interpret and compare the results, such as lack of standardization of machines, inadequate methods of measuring dosage and variables in the technic of application, including size and position of electrodes in relationship to one another, amount of air spacing used, and individual differences in thickness of the part to be treated. Experiments made *in vitro* cannot be compared to those made *in vivo*, since the heating effect of high frequency currents is partially masked in living tissue by the temperature regulating mechanism of the human body. Because of such difficulties, two of the main controversial problems in short wave therapy arise. Do high frequency currents have any specific effect on the body other than that of producing heat? Are certain wavelengths to be selected in preference to others in treating a particular tissue or condition? The author makes no claims for any specific effect other than heating, nor does he believe that it has as yet been demonstrated that any one wavelength is to be preferred to treat a specific disease. However as stated, he does outline the results of investigators, both in this country and abroad, who make such claims. In addition, the sections of the book dealing with clinical applications of short wave diathermy include treatment of conditions such as pulmonary tuberculosis, diabetes mellitus, bronchiectasis emphysema, empyema, abscess of the lung and pulmonary gangrene. Consequently it is believed that this book will not be of benefit to the general practitioner unacquainted with the speculative aspect of many of the treatments mentioned. Rather, it is recommended to the specialist in physical therapy as an admirable survey of the experimental and clinical work in the field. It contains sections on the physics of short wave machines and the various technics of application. These parts make interesting and informative reading. The discerning physician will find this book a useful addition to his therapeutic library. A comprehensive bibliography is included.

Nutrition. Final Report of the Mixed Committee of the League of Nations on the Relation of Nutrition to Health, Agriculture and Economic Policy. Communicated to the Assembly, the Council and the Members of the League. Series of League of Nations Publications. II. Economic and Financial 1937. II A 10. Official No. A 13 1937. II A Paper Pp 327. Geneva 1937.

The Mixed Committee on the Problem of Nutrition of the League of Nations was set up under a resolution of the Sixteenth Assembly in 1935 to study both the health and the economic aspects of nutrition. It includes agricultural, economic and health phases as well as reports of the Advisory Committee on Social Questions, the International Labour Organization and the International Institute of Agriculture. The members of the committee have been well chosen and include three Americans: Prof. E. V. McCollum, Prof. E. G. Nourse and Dr. Faith Williams. The results of the work of this committee, as evidenced in this final report, is a monument to international cooperation in health fields. The report reviews briefly the last century of progress in nutrition and public health, concluding that the movement toward better nutrition has made considerable progress but has not yet gone

far enough. The subject is considered from the standpoints of nutrition and health, recent trends in food habits, agricultural nutrition, food prices and consumption, factors influencing food prices, relation of income to nutrition, relation of education to nutrition, and the evidence of malnutrition in certain countries. All these elements enter into the subject in an important way, a knowledge of which is essential to the proper formulation of existing problems and their solution. It is stated that the general theoretical relation of prices to consumption is familiar in the form of "law of demand." The change in the price of any commodity tends to set up two kinds of demand reactions. In the first place, it affects the real income of consumers—raising purchasing power if the price falls, or reducing purchasing power if the price rises. The purchasing power thus gained or lost may lead to an increase or decrease in the consumption, not only of the article whose price has changed, but also of any other articles according to the consumers' scales of desires. In the second place, a change in the price of one commodity alters its cheapness or dearthness relatively to other commodities prices of which have not changed, or not changed to the same extent. This second influence is particularly important in the case of commodities for which efficient substitutes are readily available. This statement of the situation and the work on which it is based seem to be fundamental. These factors have often been lost to sight in some of the agricultural and other legislation of recent years all over the world. The report, therefore, is valuable not only to specialists in purely nutrition problems but also to legislators and economists in general. It should be consulted frequently and carefully before embarking on measures that might adversely affect food consumption.

Twenty Five Years of Health Progress. A Study of the Mortality Experience Among the Industrial Policyholders of the Metropolitan Life Insurance Company 1911 to 1935. By Louis I. Dublin, Ph.D., Third Vice President and Statistician and Alfred J. Lotko, D.Sc., Assistant Statistician. With the collaboration of the Staff of the Statistical Bureau. Cloth Pp 611 with illustrations. New York: Metropolitan Life Insurance Company 1937.

The mine of statistical information contained in this volume is the product of accurately kept and analyzed statistics over a long period and covering one of the largest groups in the United States, namely, the industrial policyholders of the Metropolitan Life Insurance Company. The period extends from 1911 to 1935 and covers a total experience of 346,500,000 years of life among the premium-paying industrial policyholders of the company. The information available, therefore, is extensive and represents in most respects a close parallelism to the life experience of the population at large. There is, in fact, little information on the trend and causes of mortality on which this volume fails to throw light. It will doubtless become a standard reference book for the desks of all those interested, from any angle, in the health and longevity of the American people.

A Practical Treatise on Diseases of the Skin for the Use of Students and Practitioners. By Oliver S. Ormsby, M.D., Clinical Professor and Chairman of the Department of Dermatology, Rush Medical College of the University of Chicago. With Revision of the Histopathology and Mycology. By Clark Wylie Finnerud, B.S., M.D., Assistant Clinical Professor of Dermatology, Rush Medical College of the University of Chicago. Fifth edition. Cloth Price \$12 Pp 1334 with 661 illustrations. Philadelphia: Lea & Febiger 1937.

The fifth edition of this thoroughly standard textbook fully lives up to expectations. In order to incorporate new material and yet keep the book reasonable in size, much reconstruction has been necessary. Twenty new diseases have been described, twelve subjects have been wholly or in part rewritten, and much necessary revision executed throughout in order to bring the work abreast of the time. The mass of dermatologic information contained in this book continues to place it among the most valuable works of its kind.

German for Students of Medicine and Science with Notes, Grammatical Introduction and Vocabulary. By W. F. Mainland, M.A., Lecturer in the Department of German, King's College, London. Cloth Price 8s 6d Pp 160. Edinburgh & London: Oliver & Boyd [n.d.]

While not a beginners' manual, this book contains many hints toward the easier and more effective utilization of German. The suggestions are designed especially for science and medical students and are illustrated by easy passages, moderately difficult passages, advanced passages and nearly a hundred pages of vocabulary.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice Failure to Reset Spiral Fractures After Slipping of Fragments.—The plaintiff sustained spiral fractures of the tibia and fibula of his right leg. The soft parts of the leg in the region of the fractures were also severely injured, with hemorrhage beneath the skin and superficial abrasions which became infected. He was taken to the Fordham Hospital, where an intern reduced the fractures. Thereafter a physician described in the record as an "assistant surgeon who specialized in the care and treatment of fractures" seems to have assumed charge of the case. During his stay at the hospital, the plaintiff had at times an elevated temperature, his pulse was more rapid than normal, and other symptoms were present that, in the words of the court, "indicated that there was a general infection at some point in his system." After remaining in the hospital for about a month, the plaintiff was released and thereafter consulted his family physician, who discovered that the plaintiff's right leg was "everted, turned out and rotated outward." An open operation to repair this condition was advised and subsequently performed. Thereafter the plaintiff sued the intern, the assistant surgeon, the house surgeon, and the director of surgery in charge of the ward in which the plaintiff had been confined. The trial court directed verdicts in favor of the intern and the house physician but rendered judgments against the other two physicians, who thereupon appealed to the supreme court of New York, appellate division, first department.

The plaintiff contended that roentgenograms taken at the hospital about ten days after the fractures were reduced showed that the fragments had slipped and that the fractures should have been reset. The plaintiff's family physician, in answer to a hypothetical question which contained no facts indicating the plaintiff's general condition testified that in his opinion the treatment rendered had been improper in that the cast should have been removed and remanipulation of the fragments attempted. He admitted, however, that a second manual reduction might have made the situation worse and, even though a better alignment was obtained, there was no assurance that the fragments could be held in place. Roentgenograms taken of the injured leg during the course of treatment did show, the assistant surgeon testified "perhaps just a slight bit more external displacement," but he did not feel justified in attempting to remanipulate the fragments because even though improvement of the alignment was obtained as to which there was little prospect of accomplishing, it would be difficult to hold the fragments in position, as no circular cast could be applied to the leg. Furthermore, this witness testified, manipulation would smooth off the irregular surfaces of the fragments which tended to hold them in place and would tend to tear small blood vessels and cause hemorrhages. In view of the presence of infection of the skin in the region of the fractures, including a boil manipulation in the opinion of the witness, might have forced particles of pus into the blood stream and resulted in the formation of emboli. Another medical witness for the defendants also testified that the methods pursued in the treatment of the plaintiff constituted proper treatment of the fractures.

The evidence of the family physician, said the supreme court, was not controlling because he had based his opinion solely on an examination of the roentgenograms and had not considered the existing condition of the plaintiff's leg and his general physical condition at the time in question. There was therefore the court said no evidence to show that the assistant surgeon had not used the skill and learning of the average physician or had not followed proper practice in his treatment of the plaintiff. With respect to the director of surgery, the court said, the case against him should not have been submitted to the jury, because he neither examined nor treated the plaintiff. As head of his surgical division he made the rounds of the ward

but did not ordinarily examine patients. He did not even see the roentgenograms taken of the plaintiff's leg nor did he have any particular duty to him, since the plaintiff was under the care of the assistant surgeon and of the intern. Apparently the case was not even discussed with him. The supreme court, therefore, reversed the judgments against the physician. — *Kinsley v. Carravetta et al* (N. Y.), 279 N. Y. S. 29.

On appeal, the Court of Appeals of New York affirmed the judgment of the supreme court. — *Kinsley v. Carravetta et al* (N. Y.), 7 N. E. (2d) 691.

Harrison Narcotic Act Insufficiency of Indictment.—Hale was convicted of violating the Harrison Narcotic Act under an indictment charging him with having sold, dispensed or distributed to a named person 2 grams of morphine sulfate "which were not then and there sold, dispensed and distributed in the original stamped package." He appealed to the United States circuit court of appeals, fourth circuit.

The section of the Harrison Narcotic Act under which the indictment was drawn, said the court, makes it unlawful for any person to purchase, sell, dispense, or distribute any of the drugs mentioned in section 1040 (a) except in the original stamped package or from the original stamped package. Wholesalers sell in the original stamped package, within the meaning of this section, retailers from the original stamped package. The initial language of this section is in the form of an absolute prohibition of purchase or sale, but this is followed by an exception which permits those who have registered and paid the tax required of them to purchase or sell, provided they do so "in" the original stamped package or "from" the original stamped package. The exception is in the disjunctive which means that one who is registered need not sell both "in" and "from" an original stamped package. A sale of narcotics does not constitute a crime under this particular section therefore even though it be in an unstamped package, unless it be also "from" an unstamped package. The indictment was defective because, in addition to charging that the sale was not made in the original stamped package, it did not charge that such sale, which was a retail sale, was not made from an original stamped package. The conviction of Hale was therefore reversed. — *Hale v. United States*, 89 F. (2d) 578.

Medical Practice Acts Injunction to Restrain Unlicensed Practice Refused.—In the opinion of the supreme court, appellate division, third department, New York, a court of equity is without jurisdiction to issue, at the instance of the people and on the relation of the attorney general an injunction to restrain an unlicensed person from practicing medicine. The unlicensed practice of medicine, said the court, is a crime for which there is an adequate remedy provided at law. This conclusion the court reached despite facts tending to show that the penalty provided for violations of the medical practice act was insufficient to deter the defendant from continuing to engage in unlicensed practice and that in two instances juries had refused to convict him. The unlicensed practice of medicine, the court said, in and of itself is not a public nuisance. — *People ex rel Bennett, Atty Gen v. Laman* (N. Y.), 292 N. Y. S. 728.

Society Proceedings

COMING MEETINGS

American Orthopsychiatric Association Chicago Feb 24-26 Dr C. La. Mar 210 East 68th St New York Secretary
Annual Congress on Medical Education and Licensure Chicago Feb 15-16 Dr W. D. Cutter 335 North Dearborn St Chicago Secretary
Middle Section American Laryngological Rhinological and Otolaryngological Society St. Louis Jan 26 Dr James B. Coates 1211 Locust St St. Louis Chairman
Pacific Coast Surgical Association Los Angeles Feb 27-28 Dr J. Glenn Bell University of California Hospital San Francisco Secretary
Southern Section American Laryngological Rhinological and Otolaryngological Society Atlanta Ga Jan 24 Dr Murdock S. Ligon 144 E. Leon Ave N.E. Atlanta Ga Chairman
Western Section American Laryngological Rhinological and Otolaryngological Society Santa Barbara Calif Jan 29-30 Dr Arthur C. Jones 101 E. Main Bldg Boise Idaho Chairman

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them. Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

194 749 888 (Dec) 1937

- A Clinical Lecture as of Twenty Five Years Ago H A Christian Boston—p 749
- *Vaccination Against Epidemic Influenza with Active Virus of Human Influenza Two Year Study J Stokes Jr A C McGuinness P H Langer Jr and Dorothy R Shaw Philadelphia—p 757
- Vasoconstrictor Properties of Benzedrine and Its Use in Relief of the Common Cold E M Boyd and W F Connell Kingston Ont—p 768
- Observations on Etiology of Toxemias of Pregnancy II Production of Acute Exacerbation of Toxemia by Sodium Salts in Pregnant Women with Hypoproteinemia M B Strauss Boston—p 772
- A Human Gallstone Composed of Calcium Phosphate A T Cameron and F D White Winnipeg Manit—p 783
- End Results Following Cholecystectomy R B Bettman and Gemma Lichtenstein Chicago—p 788
- Bundle-Branch Block with Short PR Interval in Individuals Without Organic Heart Disease Case Report with Review of Literature L F Bishop Jr New York—p 794
- Criteria of Oxygen Want with Especial Reference to Neurocirculatory Asthenia F K Hich, A W Christian and P W Smith Chicago—p 800
- Effect of Liver Extract on Absorption of Fat in Sprue W H Barker and C P Rhoads New York—p 804
- Protamine Insulinate in Treatment of Diabetes in Psychotic Patients J M Looney and W E Glass Worcester Mass—p 810
- *Coronary Thrombosis Without Pain L J Boyd and S C Werblow New York—p 814
- Cerebral Embolism as Complication of Coronary Thrombosis D L Dozzi Philadelphia—p 824
- Observations on Therapeutic Value of Sulfanilamide in Beta Hemolytic Streptococcus Pharyngitis J R Gallagher Andover Mass—p 830
- Inactivation of Estrogen by Liver Observations on Fate of Estrogen in Heart Lung and Heart Lung Liver Perfusion Systems S L Israel D R Meranze Philadelphia and C G Johnston Detroit—p 835
- Hereditary Hypoplasia of Mesenchyme (Blue Sclerotics and Brittle Bones) G E Burch and W A Sodeman New Orleans—p 844
- The Tissue Pressure in Subcutaneous Edema W A Sodeman and G E Burch New Orleans—p 846

Vaccination Against Epidemic Influenza—Stokes and his associates give the results of intramuscular vaccination of human beings in five large state colonies and a private institution with active virus of human influenza, covering the epidemics of respiratory infections of 1935-1936 and 1936-1937. Mild local reactions were noted at times when virus-infected mouse lung was used as the vaccine. Such reactions were absent when the chick embryo virus vaccine was used, aside from mild soreness such as occurs from a similar injection of 2 cc of human serum. In a very few cases and usually within twenty-four hours following the second injection of the latter vaccine, a slight watery discharge from the nose and stuffiness were noted, resembling in some respects a common cold. This cleared rapidly and appeared to be a transient vasomotor response, possibly of allergic nature. Such reactions usually followed the second injection of vaccine and were afebrile, evanescent and without generalized signs or symptoms. During the period of vaccination of all colonies from October 1936 to Jan 1, 1937, there were no epidemics of respiratory disease and from the records of all colonies it was noted that during the last months of 1936 there was unusual freedom from respiratory infections. The simplest explanation of the results recorded is that in man as in other susceptible animals an immunity is developed by intramuscular injections of active human influenza virus the degree of immunity varying inversely with the length of time following vaccination as demonstrated by exposure to the disease. Although obviously the large number of other factors involved do not permit of simple explanations, certain of the data fulfil the requirements of such a hypothesis. It is not known whether the immunity to epidemic

influenza produced by intramuscular injections of active human influenza virus is of short or long duration.

Coronary Thrombosis Without Pain—Boyd and Werblow are of the opinion that painless coronary thrombosis must be fairly common, since one third of their patients with proved coronary thrombosis manifested no pain although this point was the subject of particular interrogation in the last 127 cases coming under observation during a period of two years. Seven cases of this nature are reported in order to illustrate some of the clinical pictures encountered. Three of the seven patients were women. Most of the patients were known to have heart disease and had manifested more or less cardiac failure for periods varying from a few weeks to many years. Sudden inexplicable increased congestive failure in a known cardiac patient should arouse suspicion of coronary thrombosis, moreover, in such cases pain is usually absent. There was one case of a pain equivalent in the form of "choking," several of severe vertigo, commonly associated with periods of unconsciousness, and one of a painless episode in the so-called digestive group. The diagnosis of painless coronary thrombosis, as a rule should not be difficult if the possibility is considered. Mistakes have occurred mainly in elderly persons with known arteriosclerotic heart disease and hypertension. As these patients are singularly free from pain, they may belong to Libman's hyposensitive group. Greater attention should be paid to the nerve plexuses surrounding the coronary vessels in cases of painless coronary infarction.

American J Obstetrics and Gynecology, St Louis

34 911 1092 (Dec) 1937

- *The Prevention of Eclampsia K De Snoo Utrecht Holland—p 911
- The Stillbirth Problem P F Williams Philadelphia—p 940
- Bone Changes in Fetus Following Administration of Dicalcium Phosphate and Viosterol to the Pregnant Mother G C Finola Ruth A Trump and Mozelle Grimsom Chicago—p 955
- Modification of the Le Fort Operation for Increasing Its Scope J R Goodall and R M H Power, Montreal—p 968
- Pregnancy Complicated by Ovarian and Parovarian Tumors K M Wilson Rochester N Y—p 977
- Theca Granulosa Lutein Cell Tumors of Human Ovary and Similar Tumors of the Mammal Ovary H F Traut and J S Butterworth New York—p 987
- Experience in Treatment of Carcinoma of Fundus of Uterus with Five Year End Results in Forty Seven Patients L C Scheffey and W J Thudium Philadelphia—p 1006
- The Nitrogen Balance of a Young Primipara W H Seegers Yellow Springs Ohio—p 1019
- Triplet Pregnancy with Papyraceous Fetus S L Siegler Brooklyn—p 1023
- Photographic Records of Cervix Uteri J M Bruner L E Rosebrook and G W Cushman Des Moines Iowa—p 1027
- Abdominal Pregnancy Near Term Operation and Hormone Studies of Blood and Urine with Placenta Left in Situ A S MacGregor Brooklyn—p 1030
- Actinomycosis of the Ovary F H Falls Chicago—p 1033
- Ovarian Pregnancy A E Kanter Chicago—p 1035
- Intestinal Obstruction Complicated by Pregnancy at Term R A Reis Chicago—p 1038
- Aberrant Suprarenal Gland Tissue in Broad Ligament J A Gough Chicago—p 1040
- *Erythroblastosis Fetalis as Cause of Infantile Mortality Preliminary Report C T Javert New York—p 1042
- Unilateral Gonorrheal Salpingitis in Bicornuate Uterus H C James Tucson Ariz—p 1045
- Aid in Study of Sterility R E Krighbaum Columbus Ohio—p 1046

The Prevention of Eclampsia—In the opinion of De Snoo it is highly improbable that there is any toxin that is the causal factor in eclampsia, if for no other reason than that nearly all gravidas exhibit slight anomalies more or less. This points to there being one general cause of these anomalies, and when it is considered that disturbances of gestation but rarely occur in animals, it is obvious that one must look for this cause in the fact that the human being has deviated from nature, i e, in civilization. He believes that the common custom of salting food is in a high degree responsible for these disturbances especially edema and convulsions. He has confidence that the figure for eclampsia may be reduced, and thus in large measure will be due to the control of blood pressure, which hardly ever fails to give timely warning and to the salt-free diet which enables one with almost complete certainty to ward off the impending danger. These two facts in his opinion dominate the prevention of eclampsia.

Fetal Erythroblastosis as Cause of Infantile Mortality—Javert bases his remarks on a study of ten cases. Erythroblastosis runs part of its course intra utero and is recognizable

at birth. The obstetrician is in a strategic position for diagnosis. His suspicions are aroused before delivery by the racial (Mediterranean ancestry in 50 per cent) aspects and a history of familial jaundice. A poor weight gain and achlorhydria may also be premonitory. Hydramnios may be present. Diminished or absent fetal activity is suggestive. Fetal distress may occur. The amber-colored fluid when the membranes rupture is important. After a presumptive diagnosis of erythroblastosis in the unborn child has been made all analgesia is interdicted, although rectal ether without quinine may be used for fetal distress. Open drop ether may be used, although no anesthesia is preferred. The diagnosis is established after delivery by the deep yellow vernix or the presence of hydrops. A palpable liver and spleen are confirmatory. The increased size of the placenta, with a yellow fetal surface or an edematous appearance, is additional evidence. Erythroblasts in the blood smear, and in the fetal capillaries of the placenta, complete the diagnosis. Other conditions must be differentiated. The period of gestation averages thirty-seven weeks. The incidence of erythroblastosis at the Woman's Clinic in 1936 was 1/400 infants. However, a study of the infantile mortality reveals even a greater incidence. Stander has advocated that all those infants who weigh more than 1,500 Gm., regardless of maceration or deformity, and infants who die within the first fourteen days of life be included in the total infant mortality rate.

Archives of Internal Medicine, Chicago

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- Susceptibility of Mammalian Erythrocytes to Hemolysis with Hypotonic Solutions. Function of Differences Between Discoidal Volume and Volume of a Sphere of Equal Surface. W B Castle and Geneva A Daland, Boston—p 949
- Retention and Utilization of Parenterally Administered Iron. W M Fowler and Adelaide P Barer. Iowa City—p 967
- Critical Anaphylactic Shock During Treatment for Hay Fever. Recovery After Three Intracardiac Injections of Epinephrine. S J Joyce, Detroit—p 974
- Copper and Iron in Human Blood. V Normal Adolescent Children from 14 to 19 Years of Age. A Sachs, V E Levine and W O Griffith. Omaha—p 982
- Sympathectomy for Peripheral Vascular Disease. G de Takats. Chicago—p 990
- Origin of Neutrophils in Pernicious Anemia (Cooke's Micropolyocytes). Biopsies of Bone Marrow. O P Jones. Minneapolis—p 1002
- The Heart in Acute Nephritis. A M Master, H L Jaffe and S Dack. New York—p 1016
- Renal Function in Obstructive Jaundice. K A Elsom. Philadelphia—p 1028
- Cardiac Output in Heart Disease. Determined by Direct Fick Method Including Comparative Determinations by Acetylene Method. J McGuire, V Hauenstein and Rose Shore. Cincinnati—p 1034
- Subacute Cor Pulmonale. I C Brill and T D Robertson. Portland Ore—p 1043
- Relation of Kidneys to Blood Pressure. Effects of Extracts of Kidneys of Normal Dogs and of Dogs with Renal Hypertension on Blood Pressure of Rats. T R Harrison, A Blacklock, M F Mason and J R Williams Jr. Nashville, Tenn—p 1058
- Multiple Myeloma. Report of Four Cases with Hyperproteinemia in Two. E S Mills and J E Pritchard. Montreal—p 1069
- Significance of Hemolytic Streptococcal Bacteremia. Study of 246 Patients. C S Keefer, F J Ingelfinger and W W Spink. Boston—p 1084
- Review of Neuropsychiatry for 1937. S Cobb. Boston—p 1098

Critical Anaphylactic Shock—Joyce reports a case of a critical reaction due to ragweed antigen in which death seemed imminent for about thirty minutes. The usual precaution of withdrawing the plunger of the syringe and the prompt application of a tourniquet did not avert the crisis. The situation was saved only after three intracardiac injections of epinephrine (16 cc in one and one-half hours) and inhalation of oxygen for asphyxia resulting from acute pulmonary edema. Timidity as to the number of injections or quantity of epinephrine to be given either hypodermically or intracardially would have resulted fatally.

Sympathectomy for Peripheral Vascular Disease—De Takats declares that surgical treatment of the sympathetic nervous system in cases of peripheral vascular disease is successful when the patients are carefully selected. In sympathectomy for Raynaud's disease the following causes of failure have been recognized: (1) a too advanced stage of disease (stage 3), characterized by sclerosis of connective tissue stiffness of the joints, sclerodactylia, ulcerations and inability to open the vascular bed with heat or sodium nitrite, (2) incomplete denervation,

recognizable by residual sweating usually over the lower area in the upper and the femoral-saphenous area in the lower extremity, and (3) postoperative sensitization due to postganglionic degeneration. Since White's emphasis, sympathectomy on the upper extremities has always been performed so as to avoid postganglionic degeneration. In studying the results of sympathectomy in Buerger's disease the cause of failure can be found in trying to extend the use of sympathectomy to patients in whom the organic damage is too extensive. Sympathectomy was performed on the upper extremity in order to heal ulceration of the fingers or to prevent pulberless cold hands from becoming gangrenous. Collateral circulation here is so much more extensive that the operation can be performed in the presence of much more organic damage on the upper than on the lower extremity. The result in seven patients with causalgia, traumatic osteoporosis or polymyositis with vascular spasm are uniformly satisfactory, mainly because organic vascular damage is slight and occurs late in the disease.

Archives of Neurology and Psychiatry, Chicago

38 1135 1352 (Dec) 1937

- Epidemic Encephalitis. Follow Up Study of 266 Cases. W L Holt Jr. Boston—p 1135
- Degeneration of Boutons Terminaux in the Spinal Cord. Experimental Study. W C Gibson. Montreal—p 1145
- Factors Producing Lumbar Cerebrospinal Fluid Pressure in Man in Erect Posture. T J C von Storch. Boston. E A Carmichael and T E Banks, London. England—p 1158
- Hypertensive Apoplexy and Its Causation. W H Chase. Montreal—p 1176
- Facial Tie in Relation to Injury of Facial Nerve. Experimental Study. H A Howe, Sarah S Tower. Baltimore and A B Ducl. New York—p 1190
- Rontgenologic Study of Orientation of Pineal Body. I. Comparison of Proportional and Graphic Method in Absence of Tumor of the Brain. W W Tray. Rochester. N Y—p 1199
- A Clinicopathologic Study of Astrocytomas. R W Waggoner and J L Lowenberg. Ann Arbor. Mich—p 1208
- Changes in the Brain in Plexectomized Dogs with Comments on Cerebrospinal Fluid. G B Hassin, E Oldberg and M Tinsley. Chicago—p 1224
- Enostoses Within the Calvarium. Survey of Skulls in Warren Museum of the Harvard University Medical School. Myrielle M Canavan. Boston—p 1240
- Arterial Supply of Lateral Parahypophyseal Area of Medulla Oblongata in Man. L Alexander and T H Suh. Boston—p 1243
- Oxygen Metabolism in Schizophrenia. R G Hoskins. Boston—p 1261
- Poikilothermia with Hypothalamic Lesions. Clinicopathologic Study. C Davison and E D Friedman. New York—p 1271
- Development of Apparent Unconsciousness During Hypnotic Relief of a Traumatic Experience. M H Erickson. Elmore. Mich—p 1283
- Device for Controlled Faradic Stimulation. F A Fender and R R Newell. San Francisco—p 1289
- Adaptation of Original Weigert Technique for Staining Myelin Sheaths in Formaldehyde of Pyroxylin Material. Dorothy M Schwab and T J Putnam, Boston—p 1291

Epidemic Encephalitis—Holt has obtained information concerning 240 patients of the 266 who had their first symptom of epidemic encephalitis (von Economo's disease) during the epidemic years from 1917 to 1926 and were arbitrarily selected for this report. Seventy-eight of the patients were admitted to the hospital within the first three months after the onset of symptoms. The remainder were afflicted with sequels or were in a chronic stage when they first came under observation. Of the seventy-eight patients first seen in the acute stage at the Boston Psychopathic Hospital whose condition was diagnosed as epidemic encephalitis, 115 per cent are alive and with known sequels after from ten to sixteen years. The prognosis for lasting recovery appears not to be altered appreciably by the prominence of mental symptoms during the acute attack. Of ninety patients with sequels observed again after from ten to seventeen years, 77 per cent are apparently recovered. Of seventy-two patients with sequels who came under observation more recently, but after a longer elapsed time since the acute attack, the rate of recovery is 14 per cent. Children with behavior disorders constitute the only group with sequels of epidemic encephalitis in whom improvement may reasonably be expected.

Hypertensive Apoplexy and Its Causation—Chase analyzes the intracranial vascular changes in an effort to trace the causal sequence of these structural changes in hypertensive apoplexy. There were only eighteen cases of hypertensive apoplexy in the series of 108 cases of hemorrhagic stroke.

brain Dependent on the duration of disease and the anatomic picture, these were divided into two groups fifteen cases of hypertension for at least two years in which there was more or less diffuse thickening of muscular arteries and three cases of transient hypertension for a few weeks or months which was not associated with any arterial thickening Hypertension is characterized functionally by a condition of vascular hyperirritability and increased neurovascular tonus Its anatomic equivalent is hypertrophy of muscular arteries and hemorrhage In long continued essential hypertension, even large hemorrhages may occur in the brain by diapedesis from terminal districts and from the vasa vasorum of hypertrophied paretic muscular arteries In transient hypertension, hemorrhages in the brain from the vasa vasorum and hypertrophy of muscular arteries are absent, while petechial hemorrhages from terminal districts are not infrequent The histologic picture of small vessels in large topographic frozen sections of the brain is similar to that of small vessels in the living rabbit's mesentery after the application of any form of irritant has been made The presence of symmetrical bilateral hemorrhages of the brain in hypertension is readily explained by the neurovascular theory of causation

Oxygen Metabolism in Schizophrenia—Hoskins epitomizes the observations made by the research service of the Worcester State Hospital during the past decade which directly or indirectly bear on the problem of oxygen metabolism in schizophrenic psychosis The evidence cit 1 represents trends rather than characteristic definition of the schizophrenic group as a whole No implication is intended that the disorder constitutes an entity It has been found that the rate of oxygen consumption as determined by the method of Benedict and Roth has a significantly lower range in the schizophrenic than in the normal population when the tests are made under the same environmental conditions A lower range of blood volumes, when these are referred to the surface areas, has been found in schizophrenic than in normal subjects The circulatory rate as determined by the cyanide method was found to be only about 80 per cent of the normal rate Despite the slower circulation, the schizophrenic patient was found to abstract no more oxygen than did the control subject The glutathione and lactic acid levels of the blood were observed to be fairly independent in the control subjects but to be rather closely related in the schizophrenic group, a fact interpreted as indicating the necessity for dependence on the glutathione as an accessory respiratory mechanism Schizophrenic persons are commonly less responsive than normal subjects to thyroid and probably less responsive to dimetrophenol and amino acid The conclusion is that defective oxygen metabolism is an important feature in the schizophrenic psychosis

Journal of Biological Chemistry, Baltimore

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Diffusible Calcium of Serum and Transudates in Vivo M Miller New Haven Conn—p 59
Ionized Calcium of Serum and Transudates in Vivo M Miller New Haven Conn—p 71
Extraction and Saponification of Lipids from Blood and Blood Serum Notes Evelyn B Van and E F Gilder New Haven Conn—p 77
Metabolism of Basic Amino Acids I Rates of Absorption in Rats of Monohydrochlorides of Lysine and Histidine J R Doty and A G Eaton New Orleans—p 139
Regeneration of Blood Lipids Following Single Massive Hemorrhage in Rabbits E M Boyd and J W Stevenson Kingston Ont—p 147
Studies on Chemistry of Blood Coagulation VI Studies on Action of Heparin and Other Anticoagulants Influence of Protamine on Anticoagulant Effect in Vivo E Chargaff and K B Olson New York—p 153
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Determination of Sulfanilamide in Blood and Urine E K Marshall Jr, with technical assistance of Dorothea Babbitt Baltimore—p 263

Kansas Medical Society Journal, Topeka

38 457 500 (Nov) 1937

- Differential Diagnosis in Primary Hyperthyroidism Incipient Tuberculosis and Neurocirculatory Asthenia A M Ginsberg Kansas City, Mo—p 457
Fundamentals of Diagnosis and Treatment of Arthritis B L Wyatt, Tucson Ariz—p 460
*Insulin Therapy in Acute Alcoholic Psychoses Study of Nine Successful Cases of Alcoholic Psychoses Treated with Insulin G W Robinson Jr, Kansas City Mo—p 463
Massive Collapse of Lung Following Local Anesthesia F E Davis and T G Orr Kansas City—p 469
Influence of Sympathetic Parasympathetic and Reticulo-Endothelial Systems on Experimental Hypnosis and Catatonia M Gerundo Topeka—p 471
Surgical Drainage of Acute Salpingitis with Subsequent Pregnancy M A Walker Kansas City—p 477

Insulin Therapy in Acute Alcoholic Psychoses—Shortly after beginning the use of insulin in the treatment of the withdrawal symptoms of alcoholism, Robinson encountered a case of acute hallucinosis with insomnia, delusions, hallucinations, complete disorientation and occasional attacks of extreme, serious mania Seven hours after admission to the hospital, and one and one-half hours after the second dose of 20 units of insulin, these symptoms had cleared completely Following this he treated nine cases of acute alcoholic psychoses Each patient received insulin From 40 to 50 units of insulin divided into two doses were effective in the uncomplicated cases but the amount of insulin indicated in an individual case is the amount sufficient to produce the desired results Uncomplicated cases responded to the following technic Twenty units of insulin is given subcutaneously immediately on admission During the next three hours the patient is urged to drink all the orange juice that can be forced The second injection of 20 units is given three hours after the first The minimal requirement of orange juice to prevent reaction from the second dose seems to be at least 30 ounces (900 cc) Ordinarily, the first dose will have no effect on the patient other than to produce hunger and, from that, cooperation in the taking of fluids and nourishment The mental symptoms usually are not improved until after the second injection of insulin From half an hour to an hour after the second dose the patient begins to quiet down and soon falls asleep Sleep may be fitful for a few hours, but from three to five hours after the second dose the patient falls into a deep sleep, from which he awakens clear The psychosis may or may not return following this sleep A small dose of insulin is given shortly after the patient awakens, and thereafter no more insulin is used unless the psychosis returns or the patient is not completely clear If further injection of insulin is thus indicated, at least four hours should elapse between the awakening and the resuming of treatment, during which carbohydrates are forced by every possible means, and the routine of administering insulin is repeated at the end of this period Six of the author's patients responded perfectly according to the foregoing technic The other three cases were complicated, two with an infection of the upper part of the respiratory tract and the other with syphilis

Laryngoscope, St Louis

47 777 846 (Nov) 1937

- Bronchoscopy in Pulmonary Tuberculosis J D Hernan New York—p 777
*The Common Cold Etiologic Factors and Their Relationship to Other Respiratory Tract Conditions M B Levin Baltimore—p 792
Herpes Zoster Oculi D H Brownell Ann Arbor Mich—p 812
Sensitivity to Flowers J B Biederman Cincinnati—p 825
Kinetics of Stammering Two Factors That Seem to Facilitate Voice Production C Quinan Nevada City Calif—p 829
Carcinomatous Metaplasia in Case of Uncontrollable Polyposis of the Nose I B Goldman New York—p 836
The Ishof Needle F E Ishof New York—p 844

The Common Cold—Levin points out that repeated common colds as usually understood are virtually limited to human beings Thus far search for an animal in the lower scale that is susceptible to the repeated common cold has not been successful An analysis of the possible differences between the upper part of the respiratory tracts of human beings and various animals may aid in the solution of this problem The analysis should give precipitating physical factors, bacteriologic and immunologic factors and anatomic differences in the structures of the upper part of the respiratory tract between the human being and other animals Physical factors, such as exposure,

may be precipitating factors affecting the other two factors, either locally or by involving a breakdown in general immunity. They do not differ for human beings or domesticated animals. As for the factor of infection, no definite universal organism or virus has been decided on as the sole cause of common colds limited to man. The symptom producers locally and generally are probably the bacteria or virus. As to species immunity, it is possible that the type or method of immunologic response in the human being or some other factor is not present or has not been uncovered in any of the lower animals. With regard to differences in structure and function of the upper part of the respiratory tract of human beings and other animals, Gafaer states "The group with tonsils and adenoids, and the group without tonsils and adenoids, presented no significant difference with respect to frequency, severity and type of attack of disease of the upper respiratory tract (common cold)." The author's observations lead him to believe that the pathologic-anatomic factors have a very important bearing on the common cold.

Military Surgeon, Washington, D C

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- Emergency Dental Treatment by a Medical Officer W J Reuter — p 442
A Simple Device for Holding Electrocardiographs W G Carhart — p 451

Missouri State Medical Assn Journal, St Louis

34 431 478 (Dec.) 1937

- How Bad Is Obstetric Care? N F Miller Ann Arbor Mich — p 431
Borderline and Atypical Hyperthyroidism C M MacBryde St Louis — p 435
A Revised Conception of Early Prostatic Hypertrophy C K Smith and A L Stockwell Kansas City — p 438
Retinal Detachment Its Recognition and Treatment H R Hildreth St Louis — p 442
Complicating Urologic Diagnosis R L Hoffmann Kansas City — p 444
Improving the Cardiac Care in the Small or Community Hospital A G Asher Kansas City — p 445
Maxillofacial Injuries R L Bower Berkeley Calif — p 448

Radiology, Syracuse, N Y

29 521 650 (Nov.) 1937

- Traumatic Retroperitoneal Rupture of the Duodenum Description of Valuable Roentgen Observation in Its Recognition L Sperling and L G Rigler Minneapolis — p 521
Primary Apical Lung Cancer Producing Symptomatology of Superior Pulmonary Sulcus Tumor Report of Case H W Jacob and Margaret R Baker Pittsburgh — p 525
Demonstration of Gamma Radiation from Living Patient Following Thorotrast Injection R B Taft Charleston S C — p 530
Effect of X Rays on Oxygen Consumption of Embryonic Cell E J Boell M Ray and J H Bodine Iowa City — p 533
Cancer of the Thyroid M F Lubell Waterville Maine — p 541
Transmission of Invisible Radiation Through Various Chemical Solutions as Recorded by Infra Red Plate L C Massopust Milwaukee — p 551
Mediastinal Hernia R T Ellison Philadelphia — p 556
Two Unusual Cases of Empyema with Spontaneous Drainage A Bowen Fort Sam Houston Texas — p 562
Value of Oblique View in Radiographic Examination of Lumbar Spine S A Norton Milwaukee — p 568
*Radiation Proctitis Preliminary Report of Thirty Nine Cases H E Bacon Philadelphia — p 574
Simultaneous Lymphosarcomatosis and Carcinoma of Breast in the Same Individual Case Report H A Jud on Los Angeles — p 578
Non Green Procedure with Potter Bucky Diaphragm Preliminary Report G W Files Chicago — p 582
Carcinoma of Jejunum B Kalayjian Charleston S C — p 596
Recent Advances in Diagnosis from and Technique of Cholecystography H B Philips New York — p 602
Retention of Thorium Dioxide by Reticulo-Endothelial System R J Reeves and J E Morgan Durham N C — p 612
*New Displacement Technique for Study of Gastric Mucosal Relief I Preliminary Report A E Colcher Philadelphia — p 615
Some Lawsuits I Have Met and Some of the Lessons to Be Learned From Them Second Series Fourth Instalment I S Trostler Chicago — p 621

Radiation Proctitis—Bacon presents the data in thirty-nine cases in which radium, alone or in conjunction with X-rays, was employed outside the rectum. All the patients were women between 27 and 69 years of age. The entire group were being treated for malignant conditions of the cervix or body of the uterus, except one, who had a myofibroma. Interstitial intra-cervical or intra-uterine radiation was given in the order of frequency. The pathologic changes of radiation proctitis may be grouped in three stages. Congestion or hyperemia is noted in the early or incipient cases, the ulcerative stage is usually quite characteristic and stricture or organized narrowing of the rectal lumen. In almost every instance the patient will

mention that some form of vaginal treatment has been given previously but that now the complaint is rectal. Bleeding is invariably the most common symptom, usually associated with defecation. It may be bright red drops, dark clots or streaks on the stool. In rare instances a profuse hemorrhage is cited. The initial discomfort is indefinitely described as a dull, aching sensation, occasionally the pain is of a burning nature. Later, tenesmus of varying intensity occurs, the result of sphincter irritability from the inflammatory process. Such symptoms, a frequent and urgent desire for stool, incomplete evacuations, and fecal discharges mixed with mucus, pus, blood and necrotic material are cited in cases in which a stricture is present. With a history of interstitial uterine irradiation and the presence of a pearly white plaque situated on the anterior rectal wall there is little difficulty in making a diagnosis of radiation proctitis. However, when this process encircles the rectum it is often no easy matter to decide whether it is the result of radiotherapy or an extension of the malignant condition. In cases in which malignant change has extended to the rectum there is no typical membrane, and the constriction is irregular and nodular in contrast to the more even distribution of the fibrosis resulting from irradiation. Repeated negative biopsies from different portions of the stricture are the only absolute means of ruling out malignant extension. In cases in the first stage the prognosis depends on the behavior of the growth for which irradiation was originally given. If this responds favorably, the rectal complication is relieved. The ulcerative group, especially if fistula occurs, has a problematic prognosis. In cases in which stricture is present, of course, the prognosis assumes the doubtful aura that always surrounds this syndrome. In the first and second stages palliative treatment is usually all that is required but stricture as a rule necessitates surgical intervention. The palliative measures employed are rest in bed, a soft bland diet and liquid petrolatum by mouth. Absolute cleanliness will do much in itself to aid healing and to this end an irrigation of warm potassium permanganate solution, 1 10,000, after each defecation is helpful. If stricture is present the simplest surgical procedure is to divide the stricture longitudinally in its posterior phase with a cautery and sever the superficial fibers of the external sphincter muscles (posterior sphincterotomy). Good results will be encountered temporarily, but subsequent contraction is to be expected. It would seem therefore that, except in early cases, colostomy is the procedure of choice.

Displacement Technique for Study of Gastric Mucosal Relief—In summing up the methods used directly to outline the mucosal folds, one realizes that too much inflation or uncontrolled inflation, as well as too much pressure, may cause distention. A technique which would properly incorporate both air and an opaque medium and which would produce minimal distention and be simple in execution would therefore be desirable. To this end it occurred to Colcher that the employment of a slightly greater amount than a minimum of barium sulfate and a lesser amount than a maximum of air could be utilized so as not to disturb the mucosal markings of the stomach. This might be supplemented by the utilization of radical changes in the position of the patient, so that the air and barium could be alternately displaced and various portions of the stomach demonstrated in turn.

South Carolina Medical Assn Journal, Greenville

33 281 310 (Dec.) 1937

- The Recognition Differentiation and Management of the Common Cardiac Crises W R Mead Florence — p 281
*Chronic Hoarseness E W Carpenter and W M Carpenter, Greenville — p 287
Postoperative Rectal Injection I G Linton Charleston — p 291

Chronic Hoarseness—The Carpenters divide the causes of chronic hoarseness into four groups: inflammation followed by hypertrophies and ulcerations, new growths, neuroses and paralysis. The physician should never treat chronic hoarseness unless he can identify its cause, nor should he prescribe for or dismiss a case of hoarseness until every resource in perfecting a diagnosis has been exhausted. In adults a mirror can be used, in children a direct speculum. The inflammatory group of causes includes the acute infections, syphilis and tuberculosis with their sequence of infiltration, hypertrophies and ulcerations. Extensive laryngitis may be present with slight dysphagia.

the cords, or the cords may be extensively involved with little involvement of the rest of the larynx. Syphilis, tuberculosis, new growths and catarrhal inflammation are the most frequent causes of hoarseness in the adult. These may exist alone or in combination. Hoarseness is the only early symptom of cancer of the intrinsic larynx. Every case of unexplained hoarseness lasting more than a few weeks should be considered cancer until proved otherwise. Catarrhal inflammation of the cords sometimes taxes one's ingenuity in locating its etiology, and not only is the help of the internist required but an astute laryngologist must exclude the nasal sinuses and the habits of the patient. The authors prefer suspension laryngoscopy under a general anesthetic to biopsy as an aid to diagnosis. With this method both hands can be used, deliberation practiced and every part of the larynx manipulated. Operators of wide experience have never observed a case in which the delay caused by doing a biopsy complicated the situation or subjected the patient to greater risk.

Southern Surgeon, Atlanta, Ga

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- Removable Crossed Wires for Fractures into Joints W G Stuck San Antonio Texas—p 435
Preoperative Use of Protamine Zinc Insulinate in Case of Exophthalmic Goiter with Diabetes Mellitus C E Bird Louisville Ky—p 440
Acute Phlegmonous and Nontraumatic Perforative Lesions of the Colon Report of Three Cases with Intraperitoneal Hemorrhage Complicating One G H Bunch Columbia S C—p 449
Anemias of Pregnancy Review and Report of Cases of Macrocytic Type with Purpuric Manifestations and Malaria C R Mays Shreveport La—p 458
Some Present Day Concepts of Breast Tumors J L Rawls Norfolk Va—p 471
Sulfanilamide in Urology S T Brown Atlanta Ga—p 481
Epilepsy Discussion of Surgical and Nonsurgical Treatment R G Spurling Louisville, Ky—p 485

Surgery, St Louis

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- The Physiology of Peptic Ulcer M DeBakey New Orleans—p 653
The Pathology of Gastric Ulcer J H Dible Liverpool England—p 675
Value of Gastroscopy in Diagnosis and Surgical Treatment of Chronic Gastroduodenal Ulcer R Schindler Chicago—p 692
Indications for Operation in Cases of Uncomplicated Peptic Ulcer A L Bloomfield San Francisco—p 710
Acute Massive Hemorrhage from Upper Gastrointestinal Tract with Especial Reference to Peptic Ulcer A W Allen Boston—p 713
Peptic Ulcer Its Surgical Treatment by Conservative Measures D C Balfour Rochester Minn—p 732
Pyloroplasty and Gastroduodenostomy Consideration of Technique of Operation J M T Finney Jr Baltimore—p 738
Should Gastric Resection Be Done for Duodenal Ulcer? W Walters Rochester Minn—p 759
Adenomyoma of Inguinal Region Report of Three Cases H B Neel Rochester Minn—p 769
Removal of Upper Jaw in Historical Operation D Power London England—p 780

Texas State Journal of Medicine, Fort Worth

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- Diagnosis of Cardiac Infarction Notes E H Schwab and M B Aynesworth Galveston—p 484
Certain Clinical Aspects of the Rheumatic Type of Heart Disease J Kopecky San Antonio—p 487
Aspects of Angina Pectoris G Graves Houston—p 489
Postmortem Findings in Coronary Occlusion W W Waite El Paso—p 493
Circulatory Failure in Acute Infections W L Powers Wichita Falls—p 494
Pulmonary Embolism F E Hudson Stamford—p 498
When Not to Operate in Acute Abdominal Cases K H Aynesworth Waco—p 502
Study of a Few Common Types of Obstetric Analgesia D M Paton Houston—p 506
Glomus Tumors—Glomangiomas Report of Two Cases J L Goforth Dallas—p 510
The Significance of Hoarseness F E Lejeune New Orleans—p 513
Vasculitis Due to Streptococcus Mucosus Capsulatus P Archer Houston—p 515
Gonorrheal Vulvovaginitis Treatment with Sulfanilamide D McCullough Sanatorium—p 520

When Not to Operate in Acute Abdominal Cases— Aynesworth points out that, unless there are sensible reasons for surgical treatment, debilitated patients suffering from chronic wasting diseases as tuberculosis, pellagra, cardiovascular disease, nephritis, extreme old age, anemia and inanition should be treated by medical measures until they are fairly good surgical risks or not operated on at all. Distention

merits the closest scrutiny whether the patient has been sick for a few hours or for days. There is more surgical significance in this one sign than in all others except actual impending death. Distention of any extent, but especially when marked, interferes with all operative procedures and makes the operation difficult and tedious if not prolonged, thus increasing the danger of surgical intervention. Occasionally, cutaneous infections are a potential danger if an incision is made through such an area. When the pulse rate is high, associated with a normal heart or with a diseased heart, the surgeon should carefully weigh the consequences of an abdominal operation. More important than either the pulse rate or the abdominal distention, when considered alone, is the blood pressure if it is very low. When the blood pressure remains normal even though other symptoms of grave danger are present, the surgeon may take risks which would be inadvisable if the pressure was below normal. A marked drop in the blood pressure, in association with abdominal distention and a rapid pulse rate, cannot be overestimated. The presence of these three symptoms in combination, irrespective of the previous condition of the patient, is a positive contraindication for operation. Cardiac irregularity, valvular murmurs, hypertrophy or high blood pressure alone are not contraindications to surgical measures, but, when associated with the foregoing conditions, any cardiac disturbance augments the danger. If distention, rapid pulse and low blood pressure are present in a patient presenting an acute abdominal crisis complicated by pneumonia or pleurisy, operation is absolutely contraindicated. If the so called dangerous and absolute symptoms are not present, the surgeon should individualize each patient and operate according to his judgment. Severe acute anemia from any cause, recent hemorrhage, chronic hemorrhage, disease of the blood forming organs, recent illness and the like are all to be weighed carefully before deciding to operate in a delayed or neglected acute abdominal case. Operation should be delayed until remedial measures have been given and the patient's improvement is assured. Blood dyscrasias, as acute leukemia and similar blood diseases, are contraindications for operation in the late stages of any acute abdominal disease. Hypoglycemia and hyperglycemia in diabetic patients should be corrected before operating for a late abdominal infection. Alkalosis and acidosis, if marked, should cause the surgeon to hesitate until appropriate remedies have been begun and the patient's condition has improved. Acute insanity is a contraindication to operation unless the operation is undertaken early in the disease. Delirium from any cause, especially alcoholic or from other drugs, is a serious complication if not a positive contraindication to any serious surgical procedure, especially abdominal operations. Operation should be delayed until the patient has recovered from this state. If the delirium is due to some cerebral disease, any operation is contraindicated except that designed to treat the condition causing the trouble, no abdominal operation is justified. Coma from any cause is a definite contraindication. When the patient is at the point of death from any cause, operation should not be performed unless it is urged by those responsible. Shock is a contraindication—with the debatable exception of shock from hemorrhage—for any abdominal operation. Pregnant patients do not have normal resistance to infection. If possible, they should be carried over until every precautionary measure has been used before operating to prevent strain on the reserve store of vital resistance.

Virginia Medical Monthly, Richmond

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- Hernia in Infants and Children J S Horsley Jr Richmond—p 487
Some Observations on Endocrine Therapy E C Hamblen Durham N C—p 489
Diagnostic Significance and Clinical Management of Pulmonary Hemorrhage P P Vinson Richmond—p 492
Tuberculous Pericarditis A B Hodges Norfolk—p 494
Use of Tuberculin in Diagnosis and Treatment of Ocular Tuberculosis E W Burton University—p 499
Use of Drugs in Treatment of Urinary Tract Infections A I Dodson Richmond—p 501
Management of Vascular Hypertension J D Willis Roanoke—p 505
Diabetic Surgery at the Garfield Memorial Hospital from January 1924 to June 1936 Inclusive J W Lindsay E C Rice M A Selinger and K H Wish Washington D C—p 507
Congenital Pyloric Steno Report of Case in Premature Infant T E Oast Portsmouth—p 512
Principles and Trends in the Modern Treatment of Syphilis M I Shanbholz Bristol—p 516

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Anaesthesia, Manchester

15 140 (Oct) 1937

- Analgesia and Anesthesia in Obstetrics Pentothal Sodium Cyclopropane and Vinyl Ether W Bourne—p 1
 What Is Physical Pain? (From the French of Rene Leriche)—p 9
 Combination of Intravenous with Spinal Anesthesia Using Pentothal and Percaine R Jarman—p 20
 Note of Two Cases of Ether Convulsions R P W Shackleton—p 25

British Medical Journal, London

2 1005 1054 (Nov 20) 1937

- Treatment of Heart Failure General Considerations C Bramwell—p 1005
 Assessment of State of Nutrition and Detection of Malnutrition W R Aykroyd—p 1008
 Vitamin C Nutrition in Cases of Hematemesis and Melena S Lazarus—p 1011
 Squint and Heterophoria, with Especial Reference to Orthoptic Treatment W H McMullen—p 1015
 Treatment of Concomitant Squint by Orthoptic Methods Some General Considerations G G Penman—p 1019

Vitamin C Nutrition in Hematemesis and Melena—

Lazarus investigated the state of vitamin C nutrition in fifteen patients in whom hematemesis and melena had occurred as a complication of peptic ulcer in order to determine whether these conditions were associated with the presence of the subscorvy state. During the preliminary period of observation all were given an adequate puree diet and ferrous tartrate from the first day of admission. The amount of cevitamic acid excreted in the urine of these patients during twenty-four hours was estimated by Harris and Ray's (1933) modification of Tillman's 2,6-dichlorophenol indophenol method. On the first day of the test period the patients were given orally 700 mg of synthetic cevitamic acid, on the second and third days 1,000 mg and on the fourth day 700 mg. The excretion of cevitamic acid in the urine was estimated each day. Four control estimations were carried out. The daily excretion figures and responses to the first test dose of cevitamic acid in the control subjects correspond with those found by Harris and his co-workers in subjects whose diet was known to contain adequate amounts of foods rich in vitamin C. In two of twelve cases of hematemesis and melena the daily excretion before the test period was more than 13 mg and the ingestion of the first test dose of 700 mg of cevitamic acid was followed by a slight rise in the urinary excretion. These two cases are not below the minimal standards of excretion. The other ten patients all excreted less than 13 mg of cevitamic acid daily. None of these cases responded with a significant urinary excretion to the first test dose of 700 mg of cevitamic acid and are thus markedly below the standards of adequate vitamin C nutrition. Seven patients excreted less than 50 mg after the ingestion of the second test dose, 1,000 mg. They were thus in a more severe state of vitamin C subnutrition than the two patients who responded to the second test dose. In two cases no increased excretion of cevitamic acid in the urine resulted after the ingestion of the third test dose, 1,000 mg. A study of the percentage excretion of the last test dose shows that in all the cases the responses were below those found in the control subjects. In three of them more than 50 per cent of the 700 mg ingested was excreted. In the other nine cases values ranging from 4.6 to 48 per cent were obtained. Of the twelve patients investigated in this manner ten were suffering from vitamin C subnutrition or "subclinical scurvy." In seven this was of a severe degree. The vitamin C nutrition of three cases of hematemesis was investigated by a different method. Four, nine and twelve days after hemorrhage two tablets of a preparation containing synthetic cevitamic acid, corresponding to 200 mg of cevitamic acid, were given twice daily by mouth. The urinary excretion of cevitamic acid was estimated every second day. The addition of 200 mg of the synthetic cevitamic acid to the puree diet given to the three patients with hematemesis led to the correction of the nutritional defect in from ten to fifteen days, and produced no untoward symptoms even when started four days after the actual bleeding. It appears from the results of the investigation that the puree diet given in cases of hematemesis during the winter months did not con-

tain enough foods rich in vitamin C to restore rapidly the vitamin C deficiency. The addition of preparations of foods rich in vitamin C is thus necessary. After the patient has been given 200 mg of the preparation for from ten to fifteen days a maintenance dose equivalent to from 30 to 60 mg is advised. This could be achieved satisfactorily by giving from 60 to 100 cc of orange juice, or smaller amounts of tomato juice together with additions of fresh milk, vegetables and potatoes.

Guy's Hospital Reports, London

57 391 518 (Oct) 1937

- Studies on Tumor Formation G W Nicholson—p 391
 Mumps K E Smith—p 447
 W H Trethowan (4) A Note on His Technique of Bone Graft Edited by C Lamberton and T T Stamm—p 469
 Rigidity of Neck and Certain Considerations Arising Therefrom Medical Essay T B Layton—p 477
 Mitral Stenosis the Result of Trauma Case H Barber and G R Osborn—p 510

Rigidity of the Neck—Layton describes the physical signs of rigidity of the neck, emphasizes its importance in acute infections of the previously undamaged cleft of the middle ear and believes that the main contention of his essay has already been enunciated by one or more writers in different parts of the world. It is this: When there is the clinical association of rigidity of the neck with an inflammation of the cleft of the middle ear, the mastoid bone of the affected side or sides must be opened forthwith and the factory of organisms that is in contact with the dura mater must be removed. No one who sees a patient so affected should go to bed until this has been done, and every half hour that is lost between the onset of the symptom and the operation increases the risk to the patient. The mortality of the cases not so treated is likely to be 100 per cent, and, if recovery takes place, it is probable that a wrong estimation of the rigidity of the neck is the explanation of it.

Journal of Physiology, London

91 1100 (Oct 18) 1937

- Discharge of Impulses from Ganglion Cells J C Eccles—p 1
 Energy Liberation at Constant Diastolic Fiber Length in Tortoise Heart with Particular Reference to Effect of Emptying Pressure L F Moldavsky and M B Visscher—p 23
 A Simple Direct Coupled Amplifier for Action Potentials A Forbes and A M Grass—p 31
 Sensation of Yellow and Anomalous Trichromatism J C Halliwell and H E Roaf—p 36
 Influence of Reaction of Blood Plasma on Oxygen Consumption in Relation to Law of Isodynamic Equivalence F Kane and J M O'Connor—p 48
 Relation Between Respiratory Quotient and Alveolar Carbon Dioxide Tension O Fitzgerald and J M O'Connor—p 59
 Synchronized Reactions in Optic Ganglion of Dytiscids E D Adams—p 66
 Relation Between Plasma and Cerebrospinal Fluid Calcium A T Cameron and V H K Moorhouse—p 90

Lancet, London

2 1119 1176 (Nov 13) 1937

- Surgical Anatomy of Anal Canal and the Operative Treatment of Hemorrhoids E T C Milligan C N Morgan L F Jones and R Officer—p 1119
 *Blood Transfusion in Treatment of Blackwater Fever W B Bickel—p 1124
 The Newer Electrocardiogram Denoting Right Bundle Branch Block W Evans with pathologic report by H M Turnbull—p 117
 Mesenteric Occlusion R W Raven—p 1131
 Lymphogranuloma Inguinale in the Female N Whitaker—p 1177

Operative Treatment of Hemorrhoids—Milligan and his collaborators outline a procedure for the removal of hemorrhoids based on an anatomic study of the component parts of a hemorrhoid and of the related muscles. Though embryologically the rectum and the anal canal join at the level of the valves of Morgagni—the anocutaneous line—it is curved, and for clinical reasons that the junction of the anus and the rectum be regarded as corresponding with the easily palpable anorectal ring. The advantages claimed for the removal of hemorrhoids by the method are that 1 The ligature is directly applied above the hemorrhoid and therefore the rectum is removed—a distinct safeguard against recurrence. 2 The ligature is held down by being applied round both the longitudinal muscle and the pile pedicle below the internal sphincter. This avoids retraction of the pedicle upward with recur-

extensive "raw" areas in the anal canal, which may lead to stricture at the site of the anorectal ring. 3 Areas of anal mucosa and skin are left intact between three wounds from which regeneration successfully takes place. This is essential in order to prevent the more painful and difficult formation of stricture at the anus. 4 Accurate removal of portions of the external hemorrhoid plexus, together with trimming of the resulting wounds, considerably minimizes postoperative edema of the skin and the formation of cutaneous tags.

Blood Transfusion in Treatment of Blackwater Fever—Blackie used blood transfusion in approximately fifty cases of blackwater fever. The treatment was controlled personally throughout the whole of the illness in only twenty-two cases. Sixteen of the twenty-two cases have been placed in the toxic polyuric group, three in the anuric group and three in the relapsing group. Whereas all the patients with the polyuric and the relapsing forms survived, the anuric cases proved fatal. The deterioration in the anuric patient's condition following blood transfusion soon led to the discontinuance of this measure in the treatment of such cases. The recovery rate among the seven patients treated by blood transfusion in their homes compares favorably with the recovery rate among the hospital cases. This fact serves in great measure to reflect the intrinsic value of blood transfusion in this disease, since accessory therapeutic measures can seldom be carried out in detail in the more remote country districts. If full value is to be derived from this line of therapy, it must be instituted in the early stages of the disease and not delayed until the patient is moribund. During the hemolytic phase the body may be in considerable need of an emergency supply of red cells and, since there is evidence to show that the erythroblastic activity of the marrow is in abeyance at this time, the necessity for early transfusion is apparent. The transfusions must be repeated until there is hematologic evidence of active erythropoiesis. While blood transfusion is not indicated in every case of blackwater fever, it is predominantly useful in the toxic polyuric and in the relapsing type of case and in post-blackwater asthemia, whereas it is definitely contraindicated in toxic anuric blackwater fever.

Medical Journal of Australia, Sydney

2 857 898 (Nov. 13) 1937

- Tuberculosis and Marriage J G Hislop—p 863
Marriage and Tuberculosis The Public Health Aspect F S Hone—p 866
Renal Tuberculosis K Kirkland—p 870
Radiologic Diagnosis of Renal Tuberculosis K H Hallam—p 874
Dialthermy Treatment in Industrial Injuries J Kennedy—p 877
Pelvirectal Abscess E S Meyers—p 878

Japanese Journal of Experimental Medicine, Kyoto

15 265 354 (Oct. 20) 1937

- Relation Between Stereochemical Constitution of Fatty Acids and Physiology of Bacteria S Tetsumoto—p 265
Studies on the BCG Second Report K Yanagisawa and K Ando—p 295
Nature of Immunity to Syphilis Pathogenesis of Asymptomatic Reinfection T Tanu and S Aikawa—p 303
Statistical Observations on Metastatic Parenchymatous Keratitis in Syphilis of Rabbits K Ōguti—p 315
Histopathologic Examination of Experimental Syphilis and Yaws in Rabbits Pathologic Changes of Aortic Wall H Takahashi—p 321
Influence of Various Organ Cell Constituents Previously Heated or Exposed to X Rays on Blood Picture and Hematopoietic Organs K Tsukahara—p 329

Journal of Oriental Med., Dairen, S. Manchuria

27 101 124 (Nov.) 1937 Partial Index

- Study of Glands Reports II to IV K Mori—p 101
Lymphogranulomatosis Inguinalis (Maladie de Nicolas Favre) Report V Experimental and Clinical Studies of Venereal Lymphogranuloma K Tsasaki—p 105
Studies on Water in Manchuria V Action of Removal of Iron and Manganese and of Bacterial Purification from Water by Means of Several Zeolites T Kodama S Suzuki and Y Ishigaki—p 107
Sphenoid Sinuses in Chinese N Toida—p 109
Experimental Examination of the Secretary Relations of the Operative Stomach T Yoshitoshu—p 111
Investigation of Edema Due to the Impaired Nutrition J Doi—p 115
Frei and Ito Reactions by Licensed Prostitutes in Mukden and a Comment on the Contagious Origin of Lymphogranuloma Inguinale K Tsasaki and T Kamimura—p 117
Seven Cases of Scurvy in Adults C Kobayashi and Z Doi—p 120
Bacteriologic Examination of Tofu (Bean Curds) in Summer H Kurihara—p 122

Presse Medicale, Paris

45 1731 1754 (Dec. 4) 1937 Partial Index

- Aneurysms by Arterial Rupture in Endocarditis Lenta of the Type Jaccoud Osler C Lian P Mouloungnet and H Brocard—p 1731
*Role of Bronchial Factor in Ayerza's Black Cardiac Disease (Bronchopulmonary Cyanosis) M R Castex E Capdehourat and E S Mazzei—p 1735
Tuberculous Necroses and Pulmonary Cavities G Derscheid and P Toussaint—p 1739
Transplantation of Placental Tissue V A Tretjakov—p 1743
Artificial Pneumothorax from Diagnostic and Therapeutic Point of View L Capani—p 1745
Anatomorontogenologic Study of Curvatures of Thoracic Aorta R Heim de Balsac—p 1749

Bronchial Factor in "Black Cardiac" Disease—Castex and his associates point out that the disorder to which Ayerza applied the term black cardiac disease develops in three stages: first, the stage of chronic bronchitis, with or without bronchial dilatation or peribronchial sclerosis. Then there is the pulmonary or the bronchopulmonary stage, which by its persistent cough debilitates and exhausts the pulmonary elasticity and leads to pulmonary sclerosis and to emphysema. During this period the symptoms of black cardiac disease develop completely, there is cyanosis, polyglobulism and somnolence. The third stage is the cardiac stage, during which claudication or cardiac weakness develops. In this report the authors give their attention to the importance of the bronchial factor. They say that, whereas many of the authors who studied black cardiac disease stressed the frequency of preceding bronchial disorders, they did not attribute to it the whole importance as the constant and basic factor in the development of the syndrome. Chronic bronchitis is never missing and may precede by several years the apparent onset of the complete clinical picture. It accompanies the entire evolution and undergoes the aggravations and regressions of the other manifestations of the disease. It is an essential factor in the pathogenesis in that the development of the disorder is impossible without it. The symptoms present the first stage of the disease. The authors made observations on thirty patients. The anamnesis in all revealed a chronic cough of long standing. The period during which a patient has only a bronchial disorder varies in length but is always several years. The authors say that the cough is provoked or exacerbated by cold, by sudden changes in temperature, by changes in the atmospheric pressure, by the inhalation of fumes and so on. The expectoration is at first mucous, then mucopurulent and purulent. The bacteriologic examination discloses an abundance of the bacteria of the pyogenic infections of the respiratory tract (staphylococcus, streptococcus, pneumococcus, Micrococcus catarrhalis and so on). The chronic bronchitis produces first functional and later anatomic disorders. The roentgenologic examination confirms the physical examination: it reveals the characteristic aspects of emphysema and of chronic bronchitis. Bronchography discloses some bronchial dilatation. Discussing the results of the hemodynamic examination, the authors emphasize the augmentation of the dead space, which results in a reduction of the effective circulating air and thus intensifies the respiratory insufficiency.

45 1755 1770 (Dec. 8) 1937

- *Primary Porphyrinuria of Paralytic Type R Boulin R Garein Nèpveux and Ortolan—p 1755
Statistics on Thirty Seven Cases of Perforated Ulcers into Free Peritoneum Treated (Except Four Cases) by Suture and Complementary Gastro Enterostomy Late Results E Curtillet—p 1757

Primary Porphyrinuria with Paralysis—Boulin and his associates point out that porphyrinuria is comparatively rare. They describe a case characterized by a reddish urine, which on examination shows neither erythrocytes nor hemoglobin but on spectroscopic analysis shows the absorption band of porphyrin. The malaria, which the patient, a woman of 45, had more than ten years previously, when residing in the colonies, has never been suggested as a determining factor in porphyrinuria, and its symptoms had disappeared years ago. The porphyrinuria was not congenital and the manner in which it developed justifies referring to it as porphyrinuria with relapses. Each relapse began with severe lumbar pains followed by reddish black urine. After discussing the significance of the mild urobilinuria, the albuminuria and the mild leukocytosis, the authors say that the peripheral paralysis which developed dur-

ing the terminal period suggested by its distribution a polymelic localization at the level of the upper limbs, it was accompanied by muscular atrophy and finally developed into a more diffuse paralytic state with pains of the polyneuritic type in the lower limbs, the entire development suggested an acute descending paralysis. They stress that the extensive progressive paralysis of porphyric origin represents a true clinical entity. Moreover, this case demonstrates the importance of endogenic intoxications in the genesis of the obscure neuropathies. The chemical relation of porphyrin to hemoglobin is discussed.

Clinica Medica Italiana, Milan

68 665 744 (Oct.) 1937

- Tuberculous Cirrhosis. Case. G. M. Rasario—p. 667.
Action of Barometric Depression on Cholesterol in Blood. R. Del Zoppo—p. 689.
Intravenous Injection of Strophanthin as Test for Functions of Heart. R. Domenighini and C. Crigolo—p. 697.
Aceding Paralysis in Diabetic Patient. Case. G. Ceruti—p. 707.
Intermediate Water Metabolism in Diabetes Insipidus. Four Cases. E. Gallina—p. 713.
*Pellagroid Syndrome of Nonmiasmatic Origin in Amebiasis. Case. A. Baserga—p. 729.

Pellagroid Syndrome of Amebic Origin—Baserga's patient aged 53 years, reported with a syndrome of pellagrous erythema, neuritis and spastic paraparesis in the course of amebic dysentery. There was also gastric achylia. The patient did not eat corn. The symptoms regressed up to complete recovery of the patient by administration of a combined vitamin and antiamebic treatment. The author points out the pathogenic role of amebic dysentery in secondary pellagra. He believes that the disease lowers the resistance of the gastro-intestinal apparatus, which results in the development of a dysfunction for the assimilation and use of vitamins, from which dysfunction the pellagroid syndrome develops.

Cuore e Circolazione, Rome

21 557 608 (Nov.) 1937

- *Tolerance Test with Sodium Lactate for Diagnosis of Cardiac Insufficiency. A. Crisafulli and A. Colacresi—p. 557.
Prefibrillatory Atrial Activity. G. Dagnini—p. 571.
Dynamics of Blood in Senile Age at Rest and After Effort. Investigations and Considerations. G. C. Dogliotti, E. Montuschi and A. Beretta—p. 588.

Sodium Lactate Tolerance Test in Heart Disease—Crisafulli and Colacresi made determinations of the lactic acid in the blood of eight patients who were suffering from heart disease with moderate insufficiency and also in three normal persons for control. The determinations were made during rest and fasting immediately before and five, thirty and forty-five minutes after administration of an intravenous injection of 0.5 cc. per kilogram of body weight of a 50 per cent sodium lactate solution. The injection was administered slowly. The total amount of sodium lactate solution given in the author's group varied within 22.5 and 31.5 cc. of the solution. Lactacidemia is slightly higher in patients suffering from heart disease during fasting and rest than in normal persons in the same condition. It greatly increases in persons in both groups five minutes after the intravenous injection of sodium lactate solution. It is twice as much in normal persons and five or six times as much in patients suffering from heart disease thirty minutes after the injection. It becomes almost normal within forty-five minutes after the injection in the former, whereas it remains high for more than forty-five minutes in the latter. The author determined also the coefficient of elimination of lactic acid through the urine. It equals the amount of lactic acid which disappears from 100 cc. of the blood in a given interval in minutes. It is calculated from the amount of lactic acid that actually disappears in the given interval of minutes from 5 cc. of blood on which the determination is done. The coefficient of elimination of lactic acid is lower in patients suffering from heart diseases than in normal persons. The variations of the curve of lactacidemia in a given interval of minutes are more reliable than is the coefficient of elimination of lactic acid in showing the changes of lactacidemia which follow the administration of an intravenous injection of sodium lactate and which indicate alterations of the processes of synthesis of lactic acid and of the catabolism. The results of the test are

due to the presence of anoxemia in heart disease. The test, however, is not specific for dysfunction of the heart. The same results are obtainable in heart disease, respiratory insufficiency and intoxications with alterations of the metabolism of oxygen.

Lotta Contro La Tuberculosis, Rome

8 513 624 (June) 1937

- Mechanics of Respiration After Phrenic Exercise as Studied by Kymography. G. Torelli—p. 513.
Prevention and Treatment of Hemorrhage in Course of Jacovius Operation. P. Zorzi—p. 520.
Negative Allergy in Pneumothorax. A. Zucali—p. 528.
*Attempts by Immunizing and Stimulative Action of Congo Red Intravenously Injected in Large Doses in Pulmonary Tuberculosis. Bassi—p. 541.

Action of Congo Red in Pulmonary Tuberculosis—Bassi administered intravenous injections of 10 cc. each of a 4 per cent congo red solution to fifteen patients who were suffering from pulmonary tuberculosis. The injections were given every other day up to a total of five or six. The solutions were freshly prepared and slowly administered to patients with a fasting stomach. The treatment is well tolerated. It improves the general and nutritional conditions of the patient, stimulates the formation of platelets and leukocytes, with preponderance of neutrophils or lymphocytes, and diminishes the tendency to hemorrhage and toxemia. It does not injure the kidneys. Daily administration of the same doses induces leukopenia. The treatment has no effect on fever.

Rivista di Clinica Pediatrica, Florence

35 863 960 (Oct.) 1937

- Tumor of Spinal Cord. Clinical and Anatomopathologic Study of Case. G. Guaspari—p. 865.
*Electrocardiograms of Oculocardiac Reflex in Diphtheria. Symptomatic Value on Conditions of Myocardium in Diphtheria. Giorgini, Castelli, Borgiotti—p. 886.
Value of Search for Tubercle Bacilli in Feces in Diagnosis of Infantile Tuberculosis. P. Puccioni—p. 912.
Oxalic Acid in Milk. G. Froila—p. 919.
Focal Myocarditis of Grippal Origin. J. Kramar—p. 936.

Electrocardiograms of Oculocardiac Reflex in Diphtheria—Castelli, Borgiotti studied the behavior of the electrocardiograms in the course of the oculocardiac reflex in six children who were suffering from diphtheria and in three normal children. The disease was of different intensity and the patients had or had not developed postdiphtheritic paralysis. The electrocardiograms were taken in the first lead before, during and after induction of the oculocardiac reflex which was provoked by mechanical compression of the eyes. The author found that in normal children the oculocardiac reflex is more energetic than that in children suffering from diphtheria and that the electrocardiogram, before induction of the oculocardiac reflex, is normal. In the course of the reflex it shows pauses of the block type in alternation with the appearance of normal PQRS graphic tracings. As compression of the eyes stops, the electrocardiogram shows a normal heart rhythm. In patients who are suffering from diphtheria and show no clinical symptoms of myocarditis, the electrocardiogram before induction of the oculocardiac reflex is normal. In the course of the reflex it shows alternations of pauses of the block type, which last for three, four or five seconds, disappearance of the atrial P wave and establishment of a ventricular rhythm with normal RT waves. In the majority of the cases in diphtheritic patients, the alterations of the electrocardiogram persist for a few seconds after cessation of ocular compression. These alterations of the electrocardiogram were induced by compression of from 3 to 5 cm. of mercury in grave cases of diphtheria, from 11 to 15 cm. of mercury in cases of moderate intensity and by higher figures in normal children. According to the author the oculocardiac reflex is of diagnostic and prognostic significance in its relation to the behavior of the electrocardiogram in diphtheria. It shows latent pathologic functional conditions of the heart which are shown neither by clinical symptoms nor by the electrocardiogram alone. It shows the involvement of the myocardium and of the intracardiac system of conduction (bundle of His) in diphtheria. The alterations of the electrocardiogram in the course of the oculocardiac reflex in repeated examinations may show the evolution to convalescence or to aggravation of the condition.

Kinderärztliche Praxis, Leipzig

S 453 496 (Nov) 1937 Partial Index

- *Success and Failure of Short Wave Treatment During Childhood
W Matheja—p 453
Congenital Diaphragmatic Hernias O Heller and A Low Beer—
p 461

Short Wave Treatment During Childhood—Matheja demonstrates that in all nonspecific inflammations of the cervical lymph nodes the results of short wave treatments are more rapid and more reliable than is the case in any other form of treatment. No difficulties are encountered in the ambulatory treatment of the glands. The main effects of the short wave treatment are rapid disappearance of pain and fever, improvement in the general condition and cure. The course of the process of recovery is dependent on the duration of the glandular inflammation. New glandular swellings, in which the treatment of short waves is begun early, are quickly absorbed. Cases of adenitis that have existed for longer periods break down more rapidly under the influence of the short waves and can be subjected earlier to surgical treatment. In the presence of chronic nodules of the cervical lymph nodes and in case of specific, particularly tuberculous, adenitis, the treatment with short waves is ineffective. However, its effects are especially favorable in children with cutaneous and subcutaneous hematomas and in the deep-lying abscesses. In otitis media the results were not favorable, only the acute forms responded somewhat, but even here the short wave treatment could not be relied on, for it failed in a number of acute otitides. In chronic otitis media there was no effect whatever. Good results were obtained with short wave therapy in a case of pleural empyema, but reports in the literature indicate that such favorable results cannot be expected in all cases of pleural empyema.

Congenital Diaphragmatic Hernias—Heller and Low-Ber point out that the passage of abdominal organs or of parts of these organs into the thorax is known in the literature under the term diaphragmatic hernia. This disorder with its varying symptomatology is caused either by a traumatic defect in the diaphragm, or the hernias develop through the preformed clefts. For a better understanding of the hernias, the authors give a detailed description of the anatomy of the diaphragm and of the roentgenologic aspects of diaphragmatic hernias. Then they report the history of a boy, aged 7, who, according to the parents, had been subject to colics since early childhood. On the basis of roentgenologic examinations the disorder could be diagnosed as the result of a true diaphragmatic hernia in the region of the left Lacey's cleft, with a loop of the distal transverse colon and a dextraposition of the heart. The authors emphasize that in case of relapsing umbilical colic the possibility of a diaphragmatic hernia should be taken into consideration. If the clinical symptoms suggest ileus, the roentgenologic examination should not be limited to the verification of the ileus but attention should be given also to the diaphragm and the thoracic organs. If defects of the diaphragm are detected, the proper surgical intervention can be made and repetitions of operations can be avoided.

Medizinische Welt, Berlin

11 1629 1662 (Nov. 20) 1937 Partial Index

- Sympathetic Regulation of Water Exchange in Pathology and Therapy
R Siebeck—p 1629
Paroxysmal Hemoglobinuria Elicited by Marching Case Treatment
W Hoffmann—p 1640
Standardization of Xanthoproteomometer L Heilmeyer and J von
Mutius—p 1641
Roentgen Intoxication Its Nature and Treatment W D Germer
p 1642

Paroxysmal Hemoglobinuria Elicited by Marching—Hoffmann reports a case of paroxysmal hemoglobinuria elicited by marching. A youth, aged 16, had three attacks of paroxysmal hemoglobinuria in ten days. After the third attack he was hospitalized. His general condition was not impaired but shortly after admittance to the hospital he had another attack. The internal organs, including bladder and kidney were free from pathologic changes. With rest in bed, the hemoglobinuria disappeared. It was not possible to elicit attacks of hemoglobinuria by means of cold douches or by a strongly lordotic posture, however, walking produced attacks of hemoglobinuria

with surprising regularity. Rest in bed always counteracted the hemoglobinuria. In view of the fact that cevitic acid had produced favorable therapeutic results in cases of paroxysmal hemoglobinuria caused by cold, it was decided to try medication with cevitic acid in this case. During the period of medication and for some days later there was no attack of hemoglobinuria. But when cevitic acid was definitely discontinued there was a recurrence.

Treatment of Roentgen Intoxication—Germer says that depending on the intensity and quantity of the irradiation and on the part of the body which is influenced by the rays, there develop in a certain percentage of patients a number of symptoms which usually reach their maximum on the second or third day and then subside again in the course of two weeks. It seems that nervous persons with psychic instability are especially predisposed to roentgen intoxication. The disorder begins with headaches or stupor. The patients feel tired and weak. In addition to attacks of vertigo, gastro-intestinal disturbances develop, such as nausea, lack of appetite, vomiting and diarrhea. Then there are palpitation of the heart, irregular heart action and decrease in blood pressure. Occasionally there are fluctuations in temperature and dyspnea. The symptoms of roentgen intoxication may develop in persons who have been treated with subthreshold doses. The author's patient developed not only roentgen intoxication but also a hypersensitivity to sunlight, in that moderate exposure to the sun was followed by symptoms similar to those of x-ray intoxication. It is generally believed that the metabolic disorders elicited by the irradiation produce the symptoms either directly or by way of the sympathetic nervous system or the secretory glands. In view of the probable involvement of the sympathetic nervous system, medicaments have been employed which reduce the irritation of the vagus nerve and stimulate the sympathetic. Since hyperglycemia with glycogen deficiency of the liver has been observed in patients with roentgen intoxication, insulin together with dextrose has been recommended. Others recommend injections of sodium chloride or of calcium chloride and still others ascribe considerable significance to the temporary reduction in the cholesterol content of patients with roentgen intoxication. To increase the cholesterol content medication with a liver preparation has been recommended, but the author believes that this liver preparation improves the detoxication capacity of the liver. Following the irradiation he administers from 1 to 2 cc of liver extract (hepatrat) by a deep intramuscular injection, and he repeats this injection one hour later if necessary. In case of severe intoxication, he gives at once 5 cc. He found the liver preparation a reliable method in the treatment of roentgen intoxication.

Wiener klinische Wochenschrift, Vienna

50 1571 1602 (Nov. 19) 1937 Partial Index

- Histologic Foundations of Intercellular Pathology T Huzella—
p 1571
Virus Fluorescence Microscopy F Gerlach—p 1575
Inhibition of Local Resorption A J Leser and R Scholl—p 1577
*Method of Chemical Functional Test of Reticulo-Endothelial System by
Means of Congo Red K Stern—p 1579
Diabetes and Diseases of Throat Nose and Ear E H Mayer—
p 1581
Artificially Produced Cutaneous Tuberculosis in Treatment of Severe
Pulmonary Tuberculosis H Kutschera Aichberger Ccn—p 1582

Congo Red Test of Reticulo-Endothelial System

Stern reviews the congo red test of the reticulo-endothelial system that was introduced by Adler and Reimann and then describes his efforts to develop a better method. He outlines the technic that he and Wilhelm used in rabbits and describes a modification of this test. The reagents required are (1) a sterile 38 per cent solution of sodium citrate, (2) a sterile aqueous 1 per cent solution of congo red, which at the time of injection should not be more than twenty-four hours old, (3) a 0.1 per cent aqueous solution of congo red that is freshly prepared from the aforementioned solution by tenfold dilution, (4) an aminoacetic-hydrochloric acid buffer with 25 per cent urea, which is prepared in the following manner: 0.75 Gm of aminoacetic acid and 0.59 Gm of sodium chloride are dissolved in 100 cc of water. 52 parts of this solution are then combined with 48 parts of a tenth normal hydrochloric acid solution and 100 cc of this mixture is combined with 25 Gm of urea, (5) a 10 per cent hydrochloric acid solution. In

order to avoid a disturbing lipemia, the test should be made on the fasting patient. By means of a 5 cc syringe, which contains 1 cc of citrate solution, 4 cc of blood is taken from the vein. This mixture is placed into a centrifuge tube and marked as specimen 1. Immediately after this, the needle remaining in place, the patient is given an intravenous injection of 10 cc of a 1 per cent solution of congo red. Four and sixty minutes after this injection, blood specimens are withdrawn again in the aforementioned manner. The three specimens are then centrifuged and the plasma is suctioned off. Of each of the three specimens of plasma, 2 cc is taken and combined with 0.1 cc of the 0.1 per cent solution of congo red (that is, 100 micrograms of the dyestuff) and 2 cc of the urea-buffer solution and then acidified with 0.5 cc of the 10 per cent hydrochloric acid solution. Then colorimetry is done, specimen 1 with a congo red content of 100 micrograms serving as the standard. To determine the congo red content of the second and third specimens, it is necessary to subtract the 100 micrograms. The ratio of the congo red contents of the second and third specimens is the congo red index. The author proved the value of this method on a large clinical material but admits that further studies will be necessary to determine the exact diagnostic value of the test.

Vestnik Khirurgii, Leningrad

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 Trauma of the Heart Seven Personal Cases P. I. Vakhrashev — p 181
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 Treatment of Pseudarthrosis of the Shoulder M. M. Kasakov — p 200

Cavernous Hemangiomas of the Vertebral Column—

According to Yuzhelevskiy hemangiomas of the bones, including those of the vertebral column, are not rare lesions in postmortem sections. They are, however, seldom recognized clinically. This is even more true of hemangiomas of the bodies of the vertebrae causing symptoms of compression of the spinal cord. The literature contains but thirty-four cases of this type described by thirty-two authors. In only half of the cases was the diagnosis made before the operation or necropsy. Lack of knowledge of the clinical symptoms and of the roentgenologic appearance is responsible for the inability to recognize these cases. The author reports three instances (the largest number thus far reported by one observer) of identified vertebral hemangioma with symptoms of transverse myelitis. In one case the tumor involved the body of the first lumbar, in the second that of the fifth thoracic and in the third that of the eleventh thoracic vertebra. All three cases presented the clinical syndrome of transverse myelitis. The diagnosis in the first two cases was arrived at during the operation, while in the third the diagnosis was made before the operation on the basis of the course of the development of the disease and on the characteristic roentgenologic appearance of the vertebra. The author considers the roentgenogram of vertebral hemangioma as typical for this condition. The bony structure of the involved vertebra presents a grossly cellular, spongy appearance, with numerous clear spaces divided by fairly thick trabeculae containing lime. The intervertebral disks are not involved. Roentgenologically the lesion must be differentiated from giant cell tumor, tuberculosis of the vertebra, osteoporosis, syphilis, myeloma, metastatic carcinoma and hypernephroma, osteoma, Kummel's disease, osteomalacia and gout. The author considers the roentgenologic appearance of hemangioma sufficiently characteristic to permit of correct diagnosis. His second patient had in addition to the hemangioma of the body of the vertebra an extradural hemangioma involving the epidural connective tissue. All three patients made a clinical recovery. When the tumor cannot be radically removed because of its localization in the body of the vertebra, a decompression laminectomy with postoperative roentgen or radium therapy will be of benefit in most cases. The importance of clinical recognition of the lesion depends on the necessity for operative intervention as well as on offering to the

surgeon the possibility of instituting prophylactic preoperative measures particularly with the view to the occurrence of a diffuse hemorrhage.

Acceleration of Bone Regeneration in Fractures—In order to insure rapid bone regeneration, Golyanitskiy advocates early reduction of the fragments, not later than six hours after the injury, and their fixation by a plaster cast rather than by skeletal traction. The object is to avoid local tissue anoxia and muscle contraction. To promote acid base balance and proper oxidation of tissues, the maximum amount of motion is encouraged. Daily examinations of the blood indicate the possible development of anemia. If the hemoglobin falls below 70 per cent and the number of erythrocytes below 4,000,000 from 150 to 200 cc of blood is transfused, or repeated subcutaneous injections of the patient's own hemolyzed blood are made until the blood picture returns to normal. Because of the existence at the site of fracture of a deficiency of vitamin C, as well as because of the infrequent accompanying general hypovitaminosis, the author administers from 80 to 100 mg of ascorbic acid daily. The application of these methods in eighty-four cases resulted in marked reduction of hospitalization and in the diminution of invalidism. In cases of delayed union for as long as six months, application of the author's treatment resulted in the formation of a callus in from ten to twelve days.

Acta Radiologica, Stockholm

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- *Experimental Investigations on Effects of Roentgen Rays on Adrenal Glands in Rabbits R. B. Engelstad and O. Torgersen — p 71
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Effects of Roentgen Rays on Adrenals in Rabbits—Engelstad and Torgersen examined the adrenals of forty-one rabbits after irradiation with from 2,200 to 2,500 roentgen. The examinations were made at different times, from four hours to six months after the administration of the roentgen rays. The entire dose of roentgen rays was administered in one session. In order to evaluate properly the changes caused by the roentgen rays, control examinations were made on seventeen normal untreated animals, for it has to be borne in mind that there are considerable variations in the appearance of the cells of healthy animals. In summarizing the results of roentgen irradiation the authors say that the roentgen sensitivity of the adrenals corresponds to the cutaneous tolerance of the rabbits. The applied doses produce considerable degeneration in the adrenal cortex, also hyperemia and in some cases, inflammatory infiltration. The degeneration is most constant and most pronounced in the zona fasciculata and the zona reticularis. The medullary substance exhibits no definite signs of degeneration. The reaction curve indicates an initial hyperemia beginning within the first ten hours after the irradiation and then receding in the course of the first three or three days. A pronounced degeneration is first detected on the sixth day after the irradiation, it is accompanied by hyperemia and in a number of cases, by slight lymphocytic infiltration. The changes seem to be greatest three months after the irradiation, but even six months later there may be noticeable signs of degeneration. The distribution of the lipoids seems to be quite irregular in the irradiated adrenal glands.

Effect of Roentgen Irradiation on Reticulo-Endothelial Tissue—Chrom describes experiments which he conducted to determine whether local or general irradiation with from 1 to 75 roentgens would produce differences in the phagocytic capacity of mice that were irradiated and those that were not irradiated. In a first group of animals the region of the liver was irradiated. This experiment showed that the blood became sterile at the same time in irradiated animals and in those that had not been irradiated. Thus there is no evidence that the roentgen doses applied to the liver have been able to stimulate the reticulo-endothelial tissue of this organ to greater phagocytic activity. Another series of mice were subjected to general irradiation. This experiment likewise failed to detect an increase in the phagocytic activity.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 110, No 5

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CHICAGO, ILLINOIS

JANUARY 29, 1938

RESULTS OF RADIATION THERAPY FOR CARCINOMA OF THE UTERUS

AT THE WOMAN'S HOSPITAL NEW YORK
1919-1932

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AND
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NEW YORK

Since 1919, when we began to treat carcinoma of the uterus with radiotherapy, we have surveyed our results every two years and published them in 1925, 1928, 1930, 1932 and 1934. Three more five year series are now available, or thirteen in all. We are also giving our ten year results, as we did in the 1934 report, for we believe they are a more accurate index of the value of the therapy.

The total material we have seen in the cancer clinic to date amounts to 899 cases, as follows: cancer of the cervix 752, of which we treated 717, thirty-five being too far advanced for aid; cancer of the corpus 147, in seventy-one of which only irradiation was given and in sixty-eight operation done, sixty-two by hysterectomy and six by exploratory laparotomy only.

The five year survival rates for cancer of the cervix are based on the 595 patients seen up to May 15, 1932. Of these 572 were treated and twenty-three not treated because of the extent of the disease. The ten year survival rates are based on the 359 patients seen up to May 15, 1927. Of these 344 were treated and fifteen untreated.

The five year survival rates for cancer of the corpus are for patients seen up to Dec 31, 1931, or 108. Of these 101 were treated and seven untreated.

Up to 1933 the group with cancer of the cervix continued to show a preponderance of late carcinoma, the growth in 80 per cent being classed as Schmitz III, IV or V. Our plan of treating carcinoma of the cervix was given in previous reports, including the method of recording the extent of the disease on life-sized charts which were designed for us by Dickinson, the classification of Schmitz and that of the League of Nations, the preliminary treatment of biopsy with the high frequency knife and prophylactic blood transfusions, the technic of application and the dosage of radium, roentgen therapy, the personal monthly follow-up, repeated irradiation of vaginal and vulvar metastases, cystoscopy and explora-

tory laparotomy when indicated by late complications for accurate diagnosis and treatment.¹

Adjuvant high voltage roentgen therapy has been employed since 1930, and since 1933 the fractional method of Coutard has been used whenever it is possible to have continued cooperation of the patient for the necessary length of time. In certain cases of advanced carcinoma we have preceded the application of radium with roentgen therapy according to Healy's plan, but usually it follows the radium.

We believe that our results justify our method of combining external, intracavitary and interstitial irradiation by using intrauterine applicators and implantation of platinum needles in the periphery of the cervix for cross-fire and the vaginal colpostat. A recent publication by Pitts and Waterman² showed excellent results by a similar technic. Our average dose at the first application is from 3,600 to 4,200 milligram hours, 100 mg in the canal and from four to six platinum needles, each containing from 12.5 to 13 mg, in the periphery. Ten days later 75 mg in a silver colpostat is applied to the vaginal vault and to the right and left vaginal fornices.

Table 1 shows the five year survival rate for the 595 patients seen from Feb 15, 1919, to May 15, 1932. Of the 163 survivals, the sixty-eight classed as having early carcinoma (limited to the cervix) had an absolute and a relative cure rate of 56.2 per cent, while the ninety-five having late carcinoma (advanced beyond the cervix) had an absolute survival rate of 20 per cent and a relative rate of 21.1 per cent. The total absolute survival rate was 27.4 per cent and the relative rate 28.5 per cent. Fourteen, or 2.4 per cent, were untraced and therefore counted as dead of cancer.

A review of our results since our first report in 1925 shows that we have obtained a gradual improvement in the five year relative cure rate.

Table 2 gives the ten year survival results for the patients seen from Feb 15, 1919, to May 15, 1927. Of the seventy-eight with early carcinoma in this group thirty, or 38.5 per cent, survived, while only thirty-two of the 281 with late carcinoma, or 11.4 per cent absolute and 12 per cent relative, lived ten years or longer. The absolute survival rate for the ten years or longer for the entire group was 17.3 per cent, and the relative

Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1937.

¹ Ward G. G. and Sackett N. B. *Surg. Gynec. & Obst.* 60: 495 (Feb. 15) 1935. Ward G. G. *ibid.* 56: 434 (Feb. No. 2A) 1933. Ward G. G. and Farrar Lillian K. P. *Radium Treatment of Carcinoma of the Cervix Uteri*. J. A. M. A. 85: 159 (July 18) 1925. *Radium Statistics of Carcinoma of the Cervix Uteri* *ibid.* 91: 296 (Aug. 4) 1928. *Surg. Gynec. & Obst.* 52: 536 (Feb. No. 2A) 1931. Am. J. Obst. & Gynec. 22: 543 (Oct. 15) 1931. Sackett N. B. *New York State J. Med.* 35: 1153 (Nov. 15) 1935. Virginia M. *Monthly* 64: 129 (June) 1937. Farrar Lillian K. P. *Am. J. Obst. & Gynec.* 10: 205 (Aug.) 1925.

² Pitts H. C. and Waterman G. B. *Surg. Gynec. & Obst.* 64: 30 (Jan.) 1937.

rate was 18 per cent. Sixteen patients, or 47 per cent, were untraced and classed as having died of cancer. It is interesting to note that sixty-two of the eighty-five five year survivors in this group, 73 per cent, lived ten years or longer in spite of the lowered life expectancy due to age.

All the twenty-three patients who died between five and ten years after treatment with radium are classed

TABLE 1—Five Year End Results in Cases of Carcinoma of the Cervix

Schmitz Class	All Classes	I	II	III	IV	V	I and II Early	III and IV Late
Patients seen	595	16	165	422	49	3	121	474
Irradiated	572	16	105	421	27	3	121	451
Untreated	23	0	0	1	22	0	0	23
Living after 5 years	163	10	58	95	0	0	68	95
Absolute survival percentage	27.4	62.5	55.2	22.5	0	0	56.2	20.0
Relative survival percentage	23.5	62.5	55.2	22.6	0	0	56.2	21.1
Untraced counted dead of cancer fourteen (24 per cent)								

as dead of cancer, although many died of other causes, such as cardiovascular disease, pneumonia, diabetes and suicide. Without an autopsy, however, an accurate diagnosis of the cause of death cannot be satisfactorily determined, and we cannot be sure that carcinoma was not a contributing cause. We know of at least two patients dead or dying of cancer who have passed the ten year mark.

There has been much discussion as to the radiocurability of cancer of the cervix in relation to the histologic type of cell. The study of our results shows that the extent of the disease is of paramount importance and outweighs the type of cell in determining the prognosis. Table 3 shows that early carcinoma, regardless of the type of cell, has more than twice the curability of late carcinoma. In our series also radiosensitive, anaplastic squamous cell carcinoma (class III) has the lowest five year cure rate, and the rate for radioresistant

TABLE 2—Ten Year End Results in Cases of Carcinoma of the Cervix*

Schmitz Class	All Classes	I	II	III	IV	V	I and II Early	III and IV Late
Patients seen	359	4	74	249	32	0	78	281
Irradiated	344	4	74	249	17	0	78	266
Untreated	15	0	0	0	15	0	0	15
Living after 10 years	62	2	28	32	0	0	30	32
Absolute survival percentage	17.3	50	37.8	12.8	0	0	38.5	11.4
Relative survival percentage	18.0	50	37.8	12.8	0	0	38.5	12.0
Living after 5 years as of 5/15/32	65	2	36	47	0	0	38	47
Untraced counted dead from cancer sixteen (4 per cent)								

* This table shows that 73 per cent (sixty-two in eighty-five) of the five year survivors lived 10 years or longer in spite of the lowered life expectancy of their respective age groups.

adenocarcinoma is equal to that for the squamous cell group. More patients die of anaplastic cell carcinoma because of its more rapid dissemination in spite of its greater radiosensitivity.

In cases of cancer of the cervix, when the response to radium therapy is unfavorable from the beginning and when the conditions admit of operability, the ques-

tion as to the advisability of submitting the patient to the radical Wertheim operation, while there is yet time, should be given serious consideration.

We have seen a high incidence of carcinoma of the stump of the cervix after subtotal hysterectomy in our clinic, fifty-six instances in 752 patients, or 7.4 per cent, as shown in table 4. It has been difficult to determine accurately in some of the patients coming to us after operation elsewhere whether the disease of the cervix had existed at the time of the hysterectomy. Without doubt in a few cases the true nature of the disease had been overlooked. Our patients were seen from two weeks to eighteen years after hysterectomy. The interval was less than three years in twenty-five cases and more than three years in thirty-one cases, 55 per cent of the patients were undoubtedly free from cancer at the time of operation. The absolute five year survival rate for all these cases was 44.2 per cent, and the ten year rate was 28.5 per cent.

TABLE 3—Radiocurability of Cancer of the Cervix in Relation to the Type of Cell and the Clinical Extent of the Disease. Relative Five Year Survival Rate

Clinical Extent	Type of Cell					
	Squamous					Adenocarcinoma Total
	I	II	III	Miscellaneous*	Total	
Schmitz classes I and II early						
Irradiated	23	22	12	23	80	100
Living after 5 years	12	15	6	12	45	13
Relative survival percentage	52.2	68.2	50.0	49.9	57.0	53.3
Schmitz class III late (classes IV and V not included)†						
Irradiated	80	114	50	94	338	223
Living after 5 years	24	31	6	16	77	50
Relative survival percentage	27.9	27.2	12.0	17.0	22.4	22.1

* Mixed squamous I, II, III and unclassified.

† Results in cases of Schmitz IV and V involvement were uniformly fatal.

The desirability of removing the cervix as well as the corpus in all cases in which no undue risk is involved seems logical.

For 708 patients with carcinoma of the cervix treated from Feb. 15, 1919, to May 15, 1937, there were 1,107 applications of radium with thirteen primary deaths, or a case mortality of 1.8 per cent and a treatment mortality of 1.2 per cent.

Of the 147 patients with carcinoma of the fundus, eight were untreated, seventy-one had radium therapy alone and sixty-eight had operations, usually combined with radiation therapy. There were six exploratory laparotomies for diagnosis in advanced cases in which only a biopsy was made. There was no primary mortality in the cases in which treatment was by radium alone. There were two deaths, a rate of 3.2 per cent when panhysterectomy was employed. Four of the six patients on whom exploratory laparotomies were done died shortly after the operation, all having had advanced disease (table 5).

These statistics show the need of caution and careful selection in applying radium in cases of carcinoma of the fundus. They show also the high price of exploratory laparotomy in hopeless cases of this type. Surgical intervention was resorted to as the only means of making an accurate diagnosis of the extent of the disease and the possibility of palliation.

There is a definite need for an additional classification when the disease originates near the isthmus and involves both cervix and corpus, as has been advocated by Heyman.³ The advantage of treating this type by combining the use of radium with hysterectomy, especially if the growth is adenocarcinomatous, should be considered.

Table 6 gives the five year end results in 108 patients with carcinoma of the fundus seen from Jan 1, 1919, to Dec 31, 1931, with an absolute survival rate of 42.6 per cent, of whom 101 were treated and seven were untreated. Forty-six, or 45.5 per cent, of the treated patients survived five years. Twenty-one had surgical treatment alone, with a relative cure rate of 61.9 per cent. Fifty-nine had irradiation alone, with a relative rate of 35.6 per cent, and twenty-one had combined irradiation and hysterectomy, with a relative survival rate of 57.1 per cent. One patient was untraced.

Surgical intervention was definitely contraindicated in 47.5 per cent of the cases on account of coincidental disease, such as senility, cardiovascular disease and diabetes, and two patients refused operation after irradiation.

TABLE 4—Incidence and Curability by Irradiation of Cancer of the Cervix Following Supravaginal Hysterectomy*

Schmitz Class	All Classes	I	II	III	IV	V	I and II Early	III, IV and V Late
Patients seen to 5/15/37	56	4	9	36	6	1	13	43
Living after 5 years (in 43)	19	2	8	9	0	0	10	9
Living after 10 years (in 21)	6	1	4	1	0	0	5	1
Untreated one patient with class IV involvement								
Incidence Fifty six cases in 752 patients seen to May 15 1937 or 7.4 per cent								
Absolute five-year survival Nineteen in forty three or 44.2 per cent								
Absolute ten year survival Six in twenty one or 28.5 per cent								

* Without regard to the time which elapsed between hysterectomy and the first irradiation. This varied from two weeks to eighteen years. It was less than three years in 25 cases, over three years in thirty one cases.

We believe that panhysterectomy should be resorted to wherever possible and that the ideal procedure for treatment of carcinoma of the fundus is the combined method of diagnostic curettage with immediate insertion of radium in the cavity, the radium to remain for from 2,400 to 3,600 milligram hours, followed by a panhysterectomy and salpingo-oophorectomy within four to six weeks, and on recovery a course of roentgen therapy, preferably by the Coutard technic.

In table 7 a comparison has been made between patients with carcinoma of the cervix who had complete high voltage therapy after the application of radium and patients who had radium therapy only or for whom the roentgen therapy was inadequate or not completed satisfactorily owing to various causes.

Our series of patients who had the complete treatment is too small to provide a satisfactory five year study, a three year group is therefore given as an index, because the survival rate declines very little after the three year period.

Table 7 gives the absolute three year survival rate for 161 patients seen between May 16, 1930, and May 15, 1934, or 38.5 per cent, and the relative survival rate for 153 patients, or 40.5 per cent. These rates are naturally higher than our five year rates but serve as a basis for comparison between the patients who had

radium therapy only and those who had the completed adjuvant high voltage roentgen therapy. Of the 153 patients treated, ninety-four had radium therapy only or inadequate roentgen therapy and fifty-nine had the full radium and high voltage therapy.

The relative survival rates of these two groups, 40.4 per cent and 40.7 per cent, are too close for conclusions to be drawn, but a slight improvement is indicated for

TABLE 5—Primary Mortalities in Cases of Uterine Cancer

Patients treated for carcinoma of the cervix	708
Radium applications	1107
Primary deaths	13
Cause mortality	1.8 per cent
Treatment mortality	1.2 per cent
Surgical treatment for carcinoma of the corpus	
Patients seen from Jan 1, 1919 to Dec 31 1936	147
Untreated	8
Irradiation alone	71
Operations	68
Panhysterectomies	62
Primary deaths 2 (3.2 per cent)	
Exploratory laparotomies*	6
Primary deaths 4 (66.6 per cent)	

* For diagnosis in cases of advanced carcinoma, biopsy only.

the patients with Schmitz I or II (early) or Schmitz III carcinoma who were treated with adequate combined therapy. It will be noted that in the Schmitz III group of 119 patients seen and 117 treated, with forty-one survivals for three years, there was an improvement of 4.5 per cent in the patients receiving the combined treatment.

Of the fifty-nine patients who had standard roentgen treatment after the application of radium, fifty-three had massive dose therapy, and on six the fractional or Coutard technic was used. Of these six, three had late Schmitz III and three had Schmitz IV cancers, all hopeless. For the fifty-three patients treated by the massive dose method (our standard until January 1934), the average depth dose within the pelvis was 1.3 threshold erythema doses, now recognized as inadequate. By the fractional Coutard method it is possible to get 3.5 threshold erythema doses into the pelvis.

It is obvious that our series is too small for us to draw any conclusions of real value. Only a large five and ten year study can give a reliable index as to what

TABLE 6—Five Year End Results in Cases of Carcinoma of the Corpus Uteri

	Total	Living After 5 Years	Survival Rate Percentage
Patients seen	108	46	Absolute 42.6
Untreated	7	0	0
Treated	101	46	Relative 45.5
Surgical treatment alone	21	13	Relative 61.9
Irradiation alone	59*	21	Relative 35.6
Irradiation and surgical treatment	21	12	Relative 57.1
Untraced 1 patient counted dead of cancer			

* Operation contraindicated in twenty eight (47.5 per cent) of these because of obesity, high blood pressure, anemia or diabetes. Two refused operation after irradiation.

is accomplished by adjuvant roentgen therapy. There has been a dearth of such comparative studies, and we bring up the question in the hope of stimulating further activity in this direction. In studying the effects of roentgen therapy as an adjunct to radium therapy, one should not base his judgment on clinical impressions alone but on the five and ten year rates for absolute cure. Also, the series compared should be parallel as

to the extent of the disease and the histologic type of cell, and, finally, other important sources of improvement of percentage figures, such as a more accurate follow-up, must be borne in mind

SUMMARY

During the eighteen years that we have been treating carcinoma of the cervix with radium at the Woman's Hospital as part of a regular gynecologic service, we have salvaged for five years 27.4 per cent of the 595 patients seen and 28.5 per cent of the patients treated. In the cases of early carcinoma, in which the disease was limited to the cervix, we saved 56.2 per cent, showing the importance of treating the disease in the beginning stages.

For the 359 patients seen over a period of ten years the absolute cure rate was 17.3 per cent and the relative

TABLE 7—Effect of Standard Roentgen Therapy on the Three Year End Results in Patients with Carcinoma of the Cervix Treated with Radium

Schmitz Class	All Classes	I	II	III	IV	V	I and II Early	III IV and V Late
Total seen 5/16/30 to 5/15/34	161	6	26	119	7	3	32	129
Total treated with radium	153	6	25	117	2	3	31	122
Roentgen therapy not standard or else lacking	94	5	16	72	1	0	21	73
Standard roentgen therapy	59	1	9	45	1	3	10	49
Patients living after 3 years (all treated)	62	4	17	41	0	0	21	41
Absolute 3 year survival, percentage	38.5	66.6	65.4	34.5	0	0	65.6	31.8
Relative 3 year survival percentage	40.5	66.6	68.0	35.0	0	0	67.7	33.6
Roentgen therapy not standard or else lacking								
Cases	38	3	11	24	0	0	14	24
Relative 3 year percentage	40.4	60.0	68.7	33.3	0	0	66.6	32.0
Radium therapy and standard roentgen treatment								
Cases	24	1	6	17	0	0	7	17
Relative 3 year percentage	40.7	100	66.6	37.6	0	0	70	34.7

rate was 18 per cent. In spite of lowered life expectancy, 73 per cent of those who survived five years lived ten years or longer.

We believe that the extent of the disease is of greater importance than the type of cell in determining the probability of cure. In our series early carcinoma had twice the curability of advanced carcinoma, irrespective of the maturity of the cells and of whether they were of the squamous or adenocarcinomatous type.

The high incidence of carcinoma of the stump after supravaginal hysterectomy points to the desirability of doing a panhysterectomy whenever possible if no added risk is involved.

In 108 cases of carcinoma of the fundus an absolute five year cure rate of 42.6 per cent was obtained and a relative rate of 45.5 per cent. We believe that a panhysterectomy is the most essential part of the treatment of carcinoma of the corpus and should be employed whenever possible. Combined radiotherapy and hysterectomy seems to us the most promising method. However, surgical intervention is contraindicated in nearly 50 per cent of the cases, and radiotherapy is our only resource for this group.

There is a great need for comparative studies of the improvement obtained in combining high voltage roentgen therapy with radium therapy, and the conclusions should be based on the absolute survival rates over five and ten year periods and not on generalized clinical impressions. With the adoption of the Coutard fractional technic definite improvement may be hoped for.

Finally, a survey of the six statistical reports of our results shows an improvement in the relative five year cure rates we have obtained as follows: 1925, 23.6 per cent, 1928, 23.1 per cent, 1930, 25.5 per cent, 1932, 24.8 per cent, 1934, 25.28 per cent, and 1937, 28.5 per cent.

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ABSTRACT OF DISCUSSION

DR. MAX CUTLER, Chicago: Squamous carcinoma of the cervix occupies a unique position in the general group of squamous carcinomas that are amenable to irradiation. This is due to their anatomic location in a region which is especially favorable for radiation therapy. I can best explain by the following comparison. Cancer arising in the mucous membrane of the oral cavity and pharynx, although possessing a histologic structure precisely similar to cancer of the cervix, differs in being located in a very sensitive tumor bed. The normal tissues surrounding cancer of the cervix are able to tolerate far more intensive irradiation than the sensitive tissues of the mouth and pharynx. When the principles of radiation therapy of any given type of neoplasm are considered, the nature of the tumor bed as regards its sensitivity or resistance to irradiation is even more important than the histologic structure of the tumor. The comparative success of irradiation in the treatment of cancer of the cervix is due first to the favorable anatomic conditions for the application of radiation and second to the resistance of the normal tissues. Modern radiation therapy demands careful daily examination of the patient with special attention to the response of the tumor and the condition of the surrounding normal tissues. The histologic structure of the tumor plays an important part in the decision as to the indications or contra-indications for radiation therapy. Certain squamous carcinomas, as for example those of the esophagus, although fulfilling all the criteria of radiosensitivity, are not curable because the destruction of the lesion is invariably accompanied by perforation of the organ. The resistance of the cervical and vaginal mucous membranes to irradiation and the thickness of the muscular walls of the cervix and uterus render it possible to destroy even extensive lesions without serious damage. These favorable conditions account for the success obtained in radiation treatment of cancer of the cervix. I agree with the authors that in the consideration of prognosis the histologic factors are not as important as the anatomic extent of the disease. The only reservation is that in adenocarcinoma of the cervix, the incidence of which is about 3 per cent, the results of irradiation according to my experience have not been nearly as satisfactory as for squamous carcinoma. The treatment for cancer of the cervix that I employ is essentially similar to that of the Curie Institute of Paris. It consists of two integral parts, intracervical and external irradiation. For the former I use an intracervical radium applicator containing 50 mg. of radium with a 1 mm. platinum filter. For vaginal irradiation I employ the colpotax, each of the three corks containing 10 mg. of radium element filtered through 1 mm. of platinum. From 3,500 to 4,000 r.m. hours is administered to the cervix and a similar amount to the vagina, so that the total radium dose is from 7,000 to 8,000 r.m. hours. The cervical irradiation extends over a period of from seventy to eighty hours and the vaginal applicator from 116 to 133 hours.

DR. RIEVA ROSH, New York: The presentation of Dr. Ward and Sackett is authoritative. In our work at Bellevue Hospital we have somewhat similar conditions. In 1931 D. Kaplan published the end results in the treatment of 135 cases of carcinoma of the uterine cervix, seen between 1924 and 1931 in the radiation therapy service at Bellevue Hospital. I present I shall review the continued study of 495 cases.

during the period 1924 to 1936 I shall discuss only the results in 229 malignant cases seen and treated between 1924 and 1932 inclusive. The total number of patients alive five years or more is thirty-five. In the clinic we had a larger number of five year cures but some of the older patients are not alive today. When all cases are considered, the five year cure rate is 153 per cent, but if twenty-two cases treated elsewhere are deducted and seven in which hysterectomy was performed prior to admission and also ninety-one in which one or several treatments had been administered but the patients had never returned to complete therapy, the five year cure rate would be 28 per cent. No effort to divide the patients into groups is used at our clinic, as we feel that the grouping of cancer cannot be standardized because so much depends on the individual examiner. The anatomic classification adopted by the Cancer Committee of the League of Nations is used in our service. We rarely see cases before ulceration has extended into the deeper tissues of the cervix. Until the last four or five years, no case could be placed in group 1, while a greater number were in group 4. All of the thirty-five living patients have recently been examined. The technic employed until 1929 was one skin erythema dose to each of four areas of the lower part of the pelvis. At the end of this series radium was applied, a sound being used in the uterine canal and a colpostat placed with two or three corks against the cervix. The dose given was from 5,000 to 7,000 millicurie hours. Since 1929, an additional postradium x-ray therapy course has been given and since Phaler proved that if the saturation method is used higher doses can be delivered without damage to the skin, higher doses were given. All but three patients had a biopsy.

DR. NELSON B. SACKETT, New York. I would repeat that table 2 answers the question "If a woman survives primary irradiation for five years is she cured?" I attempted to get an answer to that question by tracing those cases for ten years. In table 2 on the bottom line the same cases are studied as of five years—that is, in 1932 instead of 1937. From the table it can be said that if a woman lives five years after irradiation she will also, in 70 per cent of the cases, be alive ten years later. In the second place, the last table, on the effects of adjuvant roentgen therapy, is only one phase of the question as to why our five and ten year results in carcinoma of the cervix are steadily improving. If we were to exclude the early years, the results would be still more startling. Our five year results would be between 35 and 40 per cent, and our relative survival in treated early cases would be from 60 to 70 per cent. There are six possible factors that occurred to me, and the first one is better material. That this is not the case has been shown in my 1935 report at Albany, in which the results during eight early years were compared with the results during eight recent years. In both series more than four fifths of the cases were Schmitz's class 3, 4 or 5. Then there was better follow-up. When untraced patients are considered dead of cancer, if one has better follow-up, one's figures will improve. The untraced cases with us are from 2 to 3 per cent all along. Third are different criteria of cure. There we must explain that the Woman's Hospital figures are not cures. They are survivals. We do not claim that a patient is cured in five years, we say she lived five years after treatment with radium. Those criteria cannot change. Fourth is pathologic confirmation. Heyman insists on this in his 1936 report. We have done the same, but nevertheless pathologic concepts seem to be changing. We have recently had to throw out one case previously considered an early cancer of the cervix but now considered to be squamous metaplasia, benign, in the healing of an erosion. Hence our figures continually are subject to review. Fifth is the adjuvant roentgen therapy, which has been discussed. We need more and larger studies with late results to settle this point, rather than clinical impressions. The sixth factor is better radium technic. Up to today we have been forced to conclude that a large part of the improvement in recent years is due to more adequate primary dosage in radiation therapy. This bears upon Dr. Cutler's discussion. We feel that cancer cells in this part of the body need from seven to ten threshold erythema doses, wherever they may lie, to eradicate the cancer. We believe that with dosage as outlined and with interstitial irradiation carrying the effect out farther, we can eradicate not only the primary lesion but the extensions to the parametrium.

CANCER OF THE THYROID

HUGH F. HARE, M.D.

AND

NEIL W. SWINTON, M.D.

BOSTON

Cancer of the thyroid is not a rare form of malignant process. In our series of 15,522 thyroid operations on 12,946 patients, primary malignant disease of the thyroid gland was seen 314 times, an incidence of 2.4 per cent. During recent years our conception of the pathology and the treatment of thyroid cancer has materially changed. In the past the outlook for the more malignant grades was considered hopeless, at present we believe that a more favorable prognosis may be given patients with the more serious forms.

In 1932 the end results following treatment in 226 cases of thyroid cancer were reported from this clinic. In the five year period following Jan. 1, 1932, eighty-eight additional patients were treated. In this more recent group, improved results were obtained, owing primarily we believe to improved radiation therapy.

In this paper our present attitude toward the diagnosis and management of thyroid cancer will be discussed according to the classification used by our pathologist, Dr. Shields Warren, as shown in table 1.

This classification is not accepted by all pathologists interested in thyroid disease, but it has been satisfactory for us in the clinical management of our cases.

TABLE 1—Classification of Cancer of the Thyroid

Group 1
1 Fetal adenoma with invasion of the blood vessels
2 Papillary adenocystoma with invasion of the blood vessels
Group 2
Adenocarcinoma
1 Papillary
2 Alveolar
Group 3
1 Small cell carcinoma
2 Giant cell carcinoma
3 Fibrosarcoma

It has been stated and generally accepted that over 90 per cent of all thyroid cancers arise in pre-existing discrete adenomas. This in itself is sufficient evidence to warrant the early removal of adenomas, and only in this way will the early diagnosis of carcinoma of the thyroid be established and treatment instituted.

Group 1 cancers are the most common form and make up 60 per cent of all thyroid cancer. They are characterized by invasion of tumor cells into the blood vessels within the adenoma and by invasion of the capsule of the adenoma. The rate of growth is slow, a recurrence having taken place in our series as late as ten years after operation. The tumor tends to recur locally rather than at distant points. However, extensive local recurrences may follow, with invasion of surrounding structures resulting fatally. In our entire series of 314 cases, recurrence followed the surgical removal of group 1 cancer twenty-six times, and death due to the tumor resulted sixteen times.

Group 2 cancers (adenocarcinoma) of the thyroid are less common than group 1, comprising 20 per cent of this entire series. They grow more rapidly and may recur locally but also metastasize to distant points. This is the type of thyroid cancer that metastasizes to

bone, but it usually spreads to neighboring lymphatics. The alveolar type has proved to be more malignant than the papillary type.

Group 3 tumors are the most malignant of all and comprise in our series 20 per cent of the entire group. It is in the treatment of this group that the greatest progress has been made during the past five years. Because of results in our previous series it was reported that irradiation was ineffective in the treatment of group 3 cancers, yet we have recently demonstrated that this group of tumors is radiosensitive, and the late results following combined surgical and radiation therapy are not as hopeless as has been previously reported.

Tumors of thyroid origin may occur in lateral and medial aberrant thyroid tissue and in thyroglossal cysts. In a recent review of thirty cases of tumor of lateral aberrant tissue seen at the clinic, the process in 60 per cent was found to be malignant.

The preoperative diagnosis of thyroid cancer is not satisfactory. The typical picture of a large firm nodular mass in the neck, with extension into the regional lymph nodes, loss of weight and tracheal obstruction represents the end stages of thyroid cancer. Treatment other than palliative in such cases is usually hopeless. Firm nodules in the thyroid gland or a history of rapidly growing discrete tumors is suggestive of malignancy, yet the differential diagnosis of early thyroid cancer, thyroiditis, adenoma with recent hemorrhage or calcification and nonmalignant simple discrete adenoma of the thyroid is not possible in many cases. In our recent series of eighty-eight cases of thyroid cancer, a preoperative diagnosis of suspected cancer was made in only 36 per cent. Only by the early removal of all the discrete tumors in the thyroid and the examination of the removed tissue by a pathologist with a wide experience in thyroid disease will early diagnosis of thyroid cancer be made and adequate treatment instituted.

The result of surgical treatment alone in patients with thyroid cancer has not been satisfactory. A high percentage of cures will follow the surgical excision of discrete adenomas with invasion of the blood vessels and capsule, but we do not believe that it is advisable or technically possible to eradicate completely the invading forms of thyroid cancer surgically. In the more advanced forms of the disease, when it is not advisable to attempt radical surgical excision, a biopsy should be performed. If a high percentage of cures is to follow the treatment of thyroid cancer, protracted high voltage radiation therapy must be combined with the surgical treatment. The amount of radiation and the prognosis are based largely on the type of tumor cell present.

Radiation therapy should be instituted as soon after operation as the condition of the patient warrants. It has been our experience that early postoperative radiation therapy does not interfere with healing of the wound. The lethal tumor dose of radiation for thyroid cancer cells has not been determined. Basing our opinion on our experience for the past five years in the treatment of eighty-eight patients with thyroid cancer, we believe that the lethal tumor dose for these cancer cells is between 3,000 and 4,000 roentgens delivered to the tumor, but of course in order to deliver this dose to the tumor a greater dose must be delivered to the skin.

Small daily divided doses of x-rays are given through two portals of 80 square centimeters, one on each side of the neck, the following factors being used: 200

kilovolts peak, 25 milliamperes, 60 cm distance, 0.75 mm of copper and 1 mm of aluminum filtration. We plan to give from 100 to 150 roentgens to each portal daily until the tumor bed has received between 3,000 and 4,000 roentgens.

In table 2 the results of treatment during the past five years as compared with the series reported in 1932 are given.

Improved results are noted for group 2 and group 3 tumors, while no improvement is noted for group 1. For group 2 the mortality has fallen from 54.8 to 14 per cent, and in the small cell cancers (group 3) the mortality has fallen from 77 to 33 per cent. One of the two fibrosarcomas (group 3) in the second series has proved radiosensitive, the patient having gone one year without evidence of recurrence. Not one of the giant cell cancers (group 3) in either series has thus far been proved to be radiosensitive.

We fully realize that it is too early to evaluate properly the end results following combined surgical and protracted radiation therapy in thyroid cancer, however, at this early date we believe that the following

TABLE 2—Results of Treatment of Thyroid Cancer

Structure and Group	Total Number of Cases		Died of Cancer Percentage		Recurrence Percentage	
	To Janu ary 1932	To Janu ary 1937	To Janu ary 1932	To Janu ary 1937	To Janu ary 1932	To Janu ary 1937
Group 1 adenoma with invasion of blood vessels	00	14	3.0	0	1	0
Papillary adenocarcinoma	61	23	7.8	8.7	4	10
Group 2 adenocarcinoma	31	29	54.8	14.0	13	34
Group 3 fibrosarcoma	3	2	100.0	50.0		
Epidermoid carcinoma	1	0	100.0			
Giant cell carcinoma	11	5	81.8	60.0	0	00
Small cell carcinoma	30	15	77.0	33.0	10	15.0
Total group 3	40	22	64.3 (Aver)	49.7 (Aver)		

conclusions can be stated regarding the management and treatment of malignant disease of the thyroid.

1 The preoperative diagnosis of cancer of the thyroid is not accurate. A microscopic study of removed tissue by a pathologist interested in thyroid disease must be done to establish the diagnosis.

2 Surgical treatment alone has proved to be unsatisfactory. If improved end results are to be attained in the treatment of all thyroid neoplasms, emphasis must be placed on adequate postoperative radiation therapy.

3 (a) The experiences of the past five years have shown that the cancerocidal dose is between 3,000 and 4,000 roentgens delivered to the tumor.

(b) Once the diagnosis has been established by an experienced pathologist, radiation therapy should be given in all cases to this amount.

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ABSTRACT OF DISCUSSION

DR HAROLD W. JACOB, Pittsburgh: Cancer of the thyroid which can be diagnosed clinically, is rarely curable. The problem is one of prophylaxis and prevention rather than diagnosis and treatment. The malignant potentialities of nodular goiter should be recognized by the medical profession. Surgical removal should be advised for all patients with nodular goiter if they show pressure symptoms, progressive increase in bulk of the goiter, suggestive fixation, hardness (not calcification), hyperthyroidism or aberrant thyroid nodules. Pat-

with cancer of the thyroid are best placed in three classes group 1, those in whom the diagnosis is made before operation, group 2, at operation, group 3, by pathologic examination. Patients of group 1 without demonstrable metastases should have as complete removal as possible, preceded and followed by high voltage roentgen or radium therapy. If the technical difficulties are too great, the procedure may be reversed or roentgen therapy alone used. Patients in group 2 should have total lobectomy or more if necessary. A course of intensive roentgen therapy should follow the operation, beginning before the patient is discharged from the hospital. In group 3 the primary operation is often curative and no further treatment is indicated. If the tumor has penetrated the capsule of the adenoma, total lobectomy should be done immediately and postoperative roentgen therapy is advisable. In the presence of recurrence, many patients may be cured through a number of years and rarely is an apparent cure brought about by roentgen therapy. If such therapy is not effective or if the malignant growth loses its radiosensitivity, further surgical treatment is of no avail. From 2,500 to 4,000 roentgens (measured in air) to each of two or more small portals measuring about 10 by 10 cm should be given over a period of thirty to forty days at the rate of from 100 to 200 roentgens per day. In this regard I differ a little from Drs Hare and Swinton. I think the greatest amount one can pour into the neck is the thing to do, being guided by clinical symptoms. Palliation, consisting of relief from pain, diminution in size of the growth and lessening of pressure symptoms occurs in about 50 per cent of cases following radiation therapy.

DR GEORGE E PFAHLER, Philadelphia. About ten years ago I reported on a series of carcinomas of the thyroid. All were either inoperable cases in which exploration had been done, in complete operations or cases in which recurrence followed operation. I got the impression at that time that these tumors were more radiosensitive than the usual carcinomas elsewhere in the body. I was rather enthusiastic about the results. These cases that I studied have not been grouped histologically. They all were confirmed by microscopic studies, however. I am mentioning this because one of the patients, found to have an inoperable condition on exploratory operation by Dr Harold Foss at Danville, was still well at the end of fifteen years. Another patient, however, who remained well after recurrence, was sent to me by Dr John Deaver, who called me up and said "Pfahler, I didn't get all of this tumor out and I know I didn't." There was no local recurrence at any time, but thirteen years later the patient died of metastatic carcinoma in the lung. So late recurrences can be expected. On the other hand, even patients with inoperable conditions may remain well probably permanently.

DR SOLOMON GINSBURG, New York. I should like to ask how many series of treatments were required in the cases treated. Was there one or more series? Second, what is the reason for using 0.75 mm of copper filtration against 0.5, 1 or 2 mm? Third, did you treat any cases of metastases of the bones or lungs? If so, what were the results?

DR HUGH F HARE, Boston. In answer to Dr Ginsburg's first question. At the present time we are giving only one series of treatments, giving our entire treatment in from twenty-five to thirty-five days. We treat again if recurrences follow. The second question asked was why we used 0.75 mm of copper filtration instead of the usual 0.5 mm. It was just an arbitrary filtration that I used. There is no particular reason for it. I think a 0.5 or 1 mm would be just as satisfactory. The third question asked was whether we have any cases of bone or lung metastases. We have treated the distant metastases with the same dosage with which we are treating the primary tumor. We have a group of six cases in which there are distant metastases that we are following. The metastatic lesions will respond as well to irradiation as the primary tumor. The group 3 tumors metastasize fairly rapidly and, in our series of small cell tumor, of the 33 per cent of the cases that we have lost it has been because of distant metastases becoming so widespread that I could not control them with roentgen treatment. Dr Murphy gave me a good hint when he said he thought the dosage was not quite large enough. He may be right in the adenocarcinomas.

THE NATURE OF THE TOXEMIAS OF PREGNANCY

JOHN P PETERS, MD

NEW HAVEN, CONN

For the last fifteen years I have become increasingly interested in the toxemias of pregnancy. For some time all patients admitted to the obstetric wards or dispensary have been seen by me or by one of the members of my department, they are treated with our advice and return to our metabolism clinic for subsequent observations. The idea that these toxemias are referable to any peculiar intoxication appears to be only a relic of the humoral theory of medicine. Clinically their closest analogy is found in nephritis and in arterial disease, pathologically the chief lesions are found in kidneys and in arteries. It therefore early became my interest to see whether the various clinical and pathologic pictures encountered in cases of toxemia could be identified with renal and vascular diseases not connected with nephritis. I propose to present briefly an analysis of from 300 to 400 cases made from this point of view. For such an approach no originality or priority is claimed.

The material consists not only of patients observed during toxemias of pregnancy but also of patients who were found to be suffering from disabilities that seemed to have had their inception in toxemias.

One of the first facts that attracted attention was the frequency with which pyelitis appeared as a precursor, associate or sequel of toxemias.¹ Of 320 patients whose records were sufficiently complete to permit analysis, forty-one, or 13 per cent, suffered at one time or another from conditions generally included under the terms pyelitis and pyelonephritis. More assiduous attention to diagnosis would probably have enlarged this number considerably. For eleven of the forty-one the diagnosis was verified at autopsy, for seventeen of the remainder, by cystoscopic examination or intravenous pyelography, the rest presented such outspoken symptoms and signs that there can be no doubt of the diagnosis. As a complement to this study the records of the hospital were searched for cases of pyelitis occurring in the course of pregnancy in which the diagnosis of toxemias was not made. In twenty-five of ninety-three such cases (i.e., 27 per cent), definite hypertension, sometimes accompanied by edema, was found to have developed before term. The list would undoubtedly have been larger if close attention had been given to determination of blood pressure. If the twenty-five patients are included with those who had toxemias connected with pyelitis, the number of the latter is swelled to sixty-six, or 19 per cent of all patients with toxemias. An additional large number of patients with pyelitis of pregnancy were left with permanent anatomic injuries of the urinary tract, e.g., hydronephrosis or ureteral strictures. Of twenty-three patients examined post mortem² who died either from acute toxemia or from remote results of conditions that seemed to originate with toxemias, ten had pyelitis or pyelonephritis.

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Read before the Section on Practice of Medicine at the Eighty Eighth Annual Session of the American Medical Association Atlantic City, N. J. June 9, 1937.

¹ Peters J P, Lavietes P H and Zimmerman H M. Pyelitis in Toxemias of Pregnancy. *Am J Obst & Gynec* 32: 911-927 (Dec) 1936.

² Zimmerman H M and Peters J P. Pathology of Pregnancy Toxemias. *J Clin Investigation* 16: 397-420 (May) 1937.

Of the forty-one patients with pyelitis who received the diagnosis of toxemia, twenty-five had outspoken toxemic syndromes, accompanied in nine by eclamptic seizures, and four had hypertension or edema or both, for the remainder the diagnosis of toxemia depended on anamnesis. The appearance with pyelitis of hypertension, edema, marked albuminuria and convulsions is unusual to say the least. Hypertension usually appears only after pyelonephritis has persisted for a long time and has destroyed a large part of both kidneys. It would seem, then, as if pregnancy contributes to pyelitis a peculiar and distinctive coloration with a propensity to explosions.

The autopsies² of the three patients who died of acute pyelitic toxemias possibly throw some light on the nature of this propensity. These patients exhibited a continuous progression of pathologic lesions corresponding to the duration of symptoms and the number of attacks of toxemia from which they had suffered. The first, a primipara, who died of acute eclamptic symptoms, presented acute pyelitis with some hydronephrosis. The second, who died in her second pregnancy, also of acute eclamptic symptoms, had a greater degree of dilatation of the renal pelvis and evidences of earlier damage behind the acute terminal condition. The older lesions were probably referable to an attack of toxemia which she had during her first pregnancy, which must have been associated with pyelitis. The third patient, after two attacks of toxemia, had advanced changes, with scarring and secondary contraction of the kidneys, evidently originating from pyelonephritis. Whether the pyelonephritis was the cause of her previous attacks of toxemia or not, it must have been in existence at least before the second attack. In addition to the pyelitis and the pyelonephrosis, the kidneys of the first two patients, who died in acute stages of toxemia, presented the tubular necroses and glomerular lesions that have been considered characteristic of eclampsia. In the livers also were typical periportal hemorrhages and necroses.

To maintain that the coexistence of these histologic changes and the toxemic symptoms was mere coincidence implies greater certainty concerning the nature and the differentiation of toxemias than the facts yet warrant. The manifestations of the attacks of toxemia associated with pyelitis were not particularly distinctive except for the incidence of symptoms referable to irritation of the urinary tract, and these were often surprisingly inconspicuous. This is not unusual, especially in persons with obstructive lesions. The patients in this group had characteristic toxemic syndromes. Nine of the forty-one had typical eclamptic seizures, the two who came to autopsy were not rare exceptions. Nine in forty-one statistically lies far outside the range of probable coincidence.

The subject of eclampsia was next chosen for more detailed analysis³ because this condition is generally reputed to be more distinctive than any of the other toxemias. The term eclampsia is used to denote toxemia with convulsions, no other satisfactory basis for distinction could be found. Altogether, sixty-eight patients had convulsive toxemia. In sixty the attacks were observed, in the other eight they had occurred earlier. Nine of the sixty-eight, or 12 per cent, belong in the series with pyelitis already mentioned. Six came to autopsy, five dying in acute stages of the disease. Although these patients died presumably of eclampsia and received this diagnosis, some did not

have the typical lesions in the liver or even in the kidneys. Conversely, periportal necroses were observed in the livers and tubular necroses and characteristic glomerular lesions in the kidneys of patients who died of noneclamptic toxemias. The most striking examples were two patients with arteriolar sclerosis and hypertension, both of whom died of dissecting aneurysm of the aorta. Both had hypertension and albuminuria, but neither had appreciable edema or any suggestion of nervous symptoms. Nevertheless both had, in addition to arterial disease of the malignant nephrosclerotic type, characteristic eclamptic lesions in kidneys and liver. In fact one of them had the most extreme periportal necroses seen in our series of autopsies. The correlation between clinical syndromes and pathologic lesions is so bad that the latter cannot serve as a basis for differentiation of toxemias. It seems more than mere chance that in pregnancy two such diverse conditions as pyelitis and arteriolar sclerosis should be accompanied by the same type of reaction in kidneys and liver.

Of forty-three patients with adequate histories, eighteen had definite records of antecedent renal or vascular disease, chiefly pyelitis, nephritis, essential hypertension and previous attacks of toxemia. Apparently the major features which predispose to eclampsia are diseases of the kidneys or arteries. Of forty-four who have been traced, thirty-three have died of or are known to have chronic renal or arterial disease. Evidence that eclampsia insults chiefly kidneys and blood vessels. Toxemia recurred in subsequent pregnancies in seventeen patients, taking an eclamptic form in six. In addition, at least seven patients had nonconvulsive toxemia in pregnancies preceding the one in which they had eclampsia. Therefore eclampsia is not, as is sometimes taught, a self-terminative condition and unlikely to recur. Moreover, the predisposition to eclampsia is in no sense specific, since in both antecedent and subsequent attacks the toxemia most often assumed a nonconvulsive form. There is every reason to believe that eclampsia resembles other toxemias in conferring susceptibility to further toxemias, even when it leaves no obvious residuums.

In certain patients examined post mortem and in others who survived, morphologic evidence or the subsequent course of the disease, and sometimes the immediately antecedent history, left no doubt that the true condition from which the patient suffered was nothing else than acute nephritis. After all, from the standpoint of symptomatology and physical signs alone the closest analogy to eclampsia outside of pregnancy is acute nephritis. The classic symptoms of this disease include albuminuria, edema, hypertension and especially in children, convulsions or other cerebral manifestations, with vomiting and gastro-intestinal disturbances being extremely common. Our conclusion is that eclampsia is not an entity, not a disease that can directly from a disorder which is peculiar to pregnancy, but a manifestation of renal or vascular disease, be it pyelitis, nephrosclerosis, chronic glomerular nephritis or acute nephritis, which is dramatized by pregnancy.

The results of the analysis of all the cases of toxemia, 351, differs in no essential respect from the analysis of the cases of eclampsia alone.⁴ Of the 150 patients from whom a satisfactory history was obtained, forty-five (possibly forty-seven) had definite antecedent disease of kidneys or arteries, which took the form of pyelitis in half. This figure does not include forty

3 Peters J P. The Nature of Eclampsia. *Yale J Biol. & Med.* 23:245 (Jan.) 1937.

4 Peters J P. Toxemias of Pregnancy. *Yale J Biol. & Med.* 31:326 (March) 1937.

eight patients in whom indubitable pyelitis appeared early in pregnancy and seven in whom it probably existed but was not discovered until later. In sixteen patients toxemia was immediately preceded by acute infection of the respiratory tract and in three by acute manifestations of rheumatic fever. It is probable that more assiduous attention would prove that the association between infections and toxemias is less fortuitous than this analysis indicates. It can be stated with certainty that the urine and the blood pressure of sixty-three patients were normal before or during the early months of their first toxemic pregnancy. Of these seven belong to the group with records of antecedent renal disease. This emphasizes again the fallacy of attempting to read the past history in the immediate symptomatology and the error of assuming that a given patient is free from renal or vascular disease because the blood pressure and the urine are at the moment normal. The fallacy is equally apparent from the records of many of the patients with recurrent pyelitis of pregnancy and in the follow-up records of many of the eclamptic patients.

As far as later pregnancies are concerned, the subsequent history of 198 patients is known. Of these thirty-seven had no further pregnancies. Of the remaining 157 only eight are known to have escaped recurrences of toxemia in later pregnancies, 144 patients had 213 subsequent attacks of toxemia of varying severity. Recurrences bore no relation to the nature of the initial toxemia.

Of 203 patients who have been observed long enough to permit deductions concerning the ultimate outcome, forty-nine have died, all with evidences of renal or vascular disease, sixty-seven (possibly seventy) are known to have residual renal or vascular disease, sixty-nine have been seen in subsequent attacks of toxemia. This leaves only fifteen who are known to be alive and without residual incapacity a year or more after their most recent attack of toxemia.

Out of this inquiry certain conclusions and hypotheses have arisen.

1 No evidence has been found to justify the usual classifications of toxemias which are based on clinical syndromes.

2 Toxemic pictures may be found that resemble all the disorders which, outside of pregnancy, give rise to arteriolar disease, hypertension and functional impairment of the kidneys. Pyelitis probably plays an unusually important part because the physiologic hydronephrosis of pregnancy renders it peculiarly malignant. Chronic nephritis and arteriolar sclerosis are also predisposing conditions of importance. Unmistakable cases of acute nephritis can be distinguished. Pathologic appearances support these clinical impressions. The sequelae of toxemias are also those which commonly result from renal and vascular diseases.

3 Little has been found to support the general impression that toxemias are manifestations of some abnormality of metabolism or of any derangement or discoordination of endocrine function. Certain anatomic and functional departures from the nonpregnant norm may heighten the susceptibility of the pregnant woman to renal and vascular insults. First among these conditions would seem to be ureteral obstruction, which, by impeding the free discharge of urine, enhances the risk of infection, reduces the capacity to eliminate an infection which has already become established and affects the course of nephritis unfavorably, often disastrously. Reduction of the concentrations of albumin, bicarbonate and sodium in

the blood serum and increase of lipoids, changes that are not in themselves sufficiently marked to give rise to any serious symptoms, are similar to the changes observed in certain types of renal disease and therefore may heighten the susceptibility of the pregnant woman to the effects of circulatory or renal disturbances. Other conditions, such as acidosis, lacticidemia, ketonemia, hyperglycemia and hypoglycemia, seem to be results, rather than causes, of toxemic disorders.

4 Pregnancy undoubtedly contributes a peculiar coloration to these renal or vascular disorders, causing relatively benign diseases to burst into a malignant state and causing the frequency of renal and vascular disease in pregnant women to exceed that in non-pregnant women of comparable ages.

5 The histologic changes in the glomeruli and tubules of a large proportion of patients who die in the acute stages of toxemia, with or without eclampsia, have certain features which are different from the lesions commonly found in acute nephritis. This may indicate that the pregnant woman reacts according to a distinctive pattern to vascular and renal insults.

6 It is one thing to admit that alterations of endocrine activity may be responsible for the changes of metabolism which accompany pregnancy and that these in turn may provide the predisposition to toxemia, it is quite another matter to attempt, in the present state of knowledge, to place the onus on a particular gland. If it should be proved that an abnormality of a particular gland is consistently associated with toxemias, it would still be quite illogical, if not absurd, to infer that chronic glomerulonephritis, chronic pyelonephritis, arteriolar sclerosis and all the other disturbances from which toxemic patients suffer are caused by this glandular abnormality (e.g., as toxemias have been connected with pituitary basophilism). It would seem more reasonable to suppose that, if the association is more than accidental, the glandular abnormality represents merely the mechanism through which hypertension and the other phenomena common to toxemia are evoked by a variety of impulses.

7 So far as ultimate treatment of the problem of toxemias as a whole is concerned, the implications of this study must be obvious. Patients with antecedent renal or vascular diseases cannot safely be carried through pregnancy. Women who have pyelitis when pregnant seldom escape irreparable and enduring damage if the pregnancy is allowed to proceed. Treatment seems to be of little benefit, since infections of the urinary tract cannot be eradicated in the presence of obstruction of the ureters. Toxemias of all kinds leave behind them marks, usually in the vascular system, that cannot be eradicated. Even if they do not manifest themselves immediately in progressive arterial or renal disease, they almost invariably flare up in subsequent pregnancies, to cause further damage. There are no clinical distinctions between toxemias in this respect. The only rational treatment, therefore, is the prevention of pregnancy in women with disease of the arteries and kidneys, and in those who have had previous attacks of toxemia, and the immediate termination of pregnancy on the appearance of the first signs or symptoms of hypertension or renal disease familiarly ascribed to toxemias. In this way permanent injury may become less frequent, and perhaps a few women may be enabled subsequently to have children without danger.

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HYPERTENSION IN THE LATE TOXEMIAS OF PREGNANCY

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AND

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The toxemias of the later months of pregnancy have been divided in order of respective clinical severity into mild preeclampsia ("low reserve kidney," "mild late toxemia," "mild recurring toxemia"), preeclampsia and eclampsia¹. Preeexisting chronic nephritis with pregnancy may also produce a late clinical picture of toxemia and for many years has been included as another toxemia ("nephritic toxemia"). A syndrome with various combinations of such symptoms and signs as headache, vertigo, visual disturbances, retinal changes, albuminuria, edema and hypertension forms a background to which convulsions and definite renal insufficiency are added in eclampsia and in "nephritic toxemia," respectively. Most of these manifestations vary with the individual patient, but hypertension is the one sign common to all late toxemias of pregnancy. Since the etiology of the late toxemias of pregnancy

which the antepartum blood pressure was 140 systolic, 90 diastolic or higher, have been grouped in the accompanying table. Blood pressure levels before delivery and on discharge from the hospital (approximately two weeks after delivery) have been arranged to correlate with age and parity.

In this correlation, age is shown to be an important factor in the postpartum hypertension of patients with late toxemia (fig 1). A steadily rising incidence of postpartum elevation of blood pressure occurs in each successive age group, 73 per cent of patients 35 years of age or over leaving the hospital with elevated blood pressure. While a brief postpartum period of observation does not tell the whole story, it does suggest that generalizations on hypertension following late toxemia of pregnancy must take the age factor into account.

The unfavorable effect of repeated pregnancy on the hypertensive vascular syndrome has been described³. In general we are decidedly inclined to this view, but our own studies require considerable explanation to support it. In chart 1 it is obvious that postpartum hypertension and parity relate directly only up to the fourth pregnancy. In the higher degrees of parity, complications of a severe vascular syndrome may have

Five Hundred Cases of the Late Toxemia of Pregnancy

Age Groups	No. of Patients	Systolic				Diastolic				Above*	Below†	Convulsions	Albumin
		230	200	170	140	150	130	110	90				
15-24	240	6	21	89	124	11	44	127	58	108	134	63	90
25-34	149	9	32	50	58	12	29	80	23	94	55	19	117
35-44	105	17	20	44	24	12	26	41	26	77	28	8	80
45-54	6	1	3		2	2		4		5	1	1	4
Above*	282	30	58	90	104	30	72	131	49			51	220
Below†	218	3	18	93	104	7	27	121	63			43	185
Gravid 1	229	7	24	89	109	11	40	122	56	96	133	68	908
2	51	4	8	15	24	4	10	27	10	23	23	11	43
3	42	2	3	18	19	2	6	25	0	30	12	8	35
4	29	1	13	5	10	3	11	10	5	23	6	3	14
5	27	2	3	11	11	3	5	15	4	18	0	2	21
6	20	3	5	8	4	2	6	10	2	18	2	1	14
7	22		4	10	8	2	4	8	8	13	0	2	17
8	9	1		6	2		2	4	3	5	4	1	6
9	15	2	1	6	6	1	3	6	5	8	7		8
10	16	2	4	4	6	3	1	9	3	14	2		8
11	13	1	5	3	4	1	4	7	1	9	4	2	7
12+	27	8	6	8	5	5	7	9	6	20	7	1	91
Convulsions	99	4	21	38	36	8	23	60	8	51	48		
Albumin	405	33	67	153	152	35	86	201	63	220	185		

* Blood pressure on discharge approximately two weeks after delivery 140 systolic 90 diastolic and above
† Blood pressure on discharge below 140 systolic 90 diastolic

is obscure and classification therefore unsatisfactory, it would seem profitable to study this one common sign, hypertension.

Normally a postpartum fall in blood pressure follows the usual slight rise prior to delivery². Subsequently there is a gradual decline to the previous nonpregnant level. However, in the toxemia of pregnancy the postpartum drop is sharper, with a secondary rise. The pressure then either returns to normal or shows a period of sustained elevation.

It is our purpose to comment on the antepartum and postpartum blood pressure in 500 cases of late toxemia of pregnancy and to refer briefly to present knowledge bearing on the outcome in similar cases. Several case reports have been included by way of illustration.

Five hundred cases conforming to the usual diagnostic criteria for late toxemia of pregnancy, in all of

eliminated women who would otherwise have gone on to further pregnancies with hypertension. No doubt many women acquire hypertension later, but our own observations do not show as clear a relationship between hypertension and multiparity as between hypertension and age.

A direct relation between height of blood pressure and postpartum hypertension is seen in chart 2. The higher the antepartum pressure, the more likely is postpartum hypertension. This is equally true for systolic and for diastolic blood pressure.

The antepartum convulsions of eclampsia did not presage postpartum hypertension, as only 18 per cent of our patients having subsequent elevation of the blood pressure had had convulsions whereas convulsions occurred in 22 per cent without postpartum hypertension.

Antepartum albuminuria likewise failed to predict postdelivery elevation of the blood pressure, as 77 per cent of the patients having postpartum elevation of

From the Departments of Internal Medicine and Obstetrics and Gynecology, University of Virginia Department of Medicine.
Read before the Section on Practice of Medicine at the Eighty Eighth Annual Session of the American Medical Association Atlantic City, N. J. June 9, 1937.
1. Mussey, R. D. quoted by Curtis, A. H. *Obstetrics and Gynecology* 1: 1025 (1934).
2. Simmons, E. J. and Rasmussen, C. C. *Blood Pressures During Pregnancy, Labor and Puerperium* Minnesota Med 30:3 (May) 1925.
3. Corwin, Jean and Herrick, W. W. *Toxemias of Pregnancy in Relation to Chronic Cardiovascular and Renal Disease* Am J Obstet Gynec 14: 783 (Dec) 1927.

arterial pressure had shown albumin in the urine before delivery, whereas 85 per cent of those having normal pressure at the end of their hospital stay also had antepartum albuminuria.

Since a fairly high percentage of patients with late toxemia of pregnancy have early postpartum hypertension, the question naturally arises as to what proportion

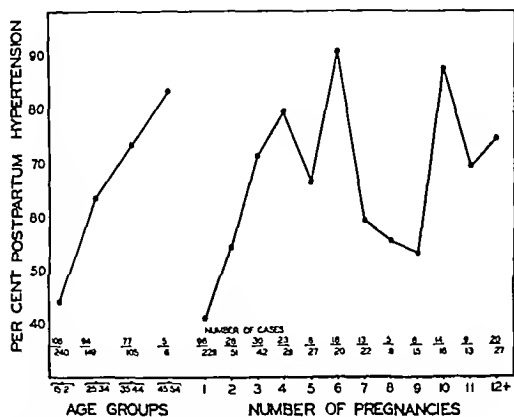


Chart 1—Incidence of postpartum hypertension related to age and number of pregnancies

of patients with hypertensive toxemia will show sustained elevation of the blood pressure.

Statistical treatment of this subject is likely to be inconclusive unless the group is large and observation of individual members frequent and prolonged. In view of the patient's youth, a study of the blood pressure curve in case 1 (chart 3) strongly suggests an association between the onset of pregnancy and the beginning of essential hypertension. The wide swings of blood pressure, with a general downward trend, proved deceptive, as retinal changes, cardiac enlargement and a normal systolic but elevated diastolic pressure were found fourteen months after delivery.

CASE 1 (chart 3)—A primipara, aged 17, a Negro, who entered the hospital April 4, 1936, having been in labor for twenty-four hours, had had no serious illnesses in the past and nothing to suggest renal or vascular complications. The first six months of pregnancy had been uneventful. Headache,

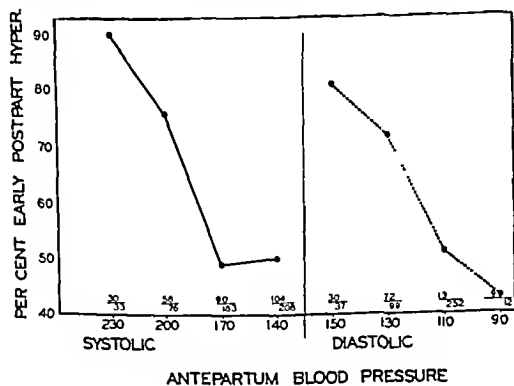


Chart 2—Incidence of early postpartum hypertension related to antepartum blood pressure

vertigo, some visual disturbance and edema of the ankles had become features of the last three months.

Examination showed that she was small and thin with a contracted pelvis. Owing to small pupils the eye grounds were not well visualized. The heart was not enlarged, the rhythm was normal and a faint systolic murmur could be heard at the apex. There was slight definite edema of the ankles. The blood pressure was 190 systolic 130 diastolic subsequent

levels are shown in chart 3. The urine showed a specific gravity of 1.020 and a 4+ reaction for albumin. The albuminuria had not fully cleared up before the patient's discharge from the hospital. The blood urea content was 68 mg per hundred cubic centimeters on admission and 47 mg three days later. The Wassermann reaction of the blood was negative.

Subsequent visits to the outpatient department showed wide fluctuations of blood pressure. The urine remained albumin free with two exceptions, and the patient did well until about one month before the last examination, when morning headache had become a frequent and annoying feature.

Examination June 5, 1937, revealed definite thickening and tortuosity of the retinal arteries, a blood pressure of 135 systolic, 105 diastolic and definite enlargement of the heart to the left. Orthodiagraphic and fluoroscopic examination confirmed this enlargement in spite of the fact that the cardiothoracic ratio was at the upper limit of normal. The orthodiagraphic measurements were as follows: great vessels 4.2 cm, medial right 2.7 cm, medial left 8.9 cm, thorax 20.7 cm and cardiothoracic ratio 57 per cent. The patient's height was 60 inches (152 cm) and weight 113 pounds (51 Kg). The predicted area of the (cardiac) frontal plane was 87 square centimeters and the measured area 96 square centimeters.

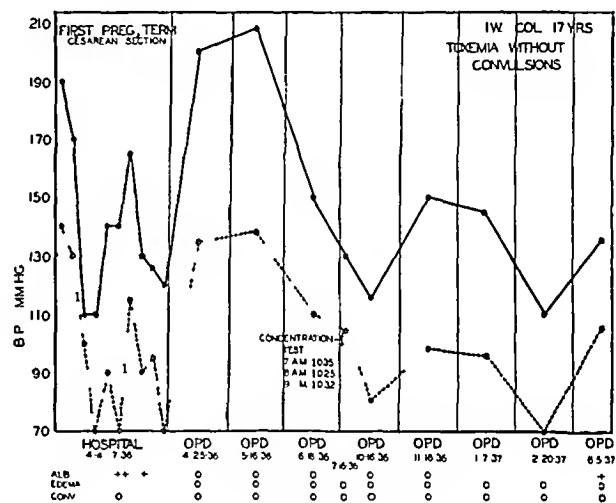


Chart 3—Clinical course in case 1

It is not uncommon to find wide variations of blood pressure in a patient with known hypertensive vascular disease, particularly before and after pregnancy, so that an occasional normal reading is no proof against established hypertension. Fluctuations of blood pressure in essential hypertension are well recognized, but vasomotor lability is particularly pronounced during and after pregnancy.

A striking example of the unfavorable effect of the toxemia of pregnancy in a young Negro woman has been recorded in case 2, chart 4. This patient progressed rapidly to malignant nephrosclerosis and death. The probable acceleration of the renal vascular condition by the first pregnancy was even more evident after the second. While vascular disease was probably established at the first pregnancy, prevention of the second might well have tempered the outlook.

CASE 2 (chart 4)—A Negro woman aged 29 pregnant for six months, entered the hospital Jan 10, 1931, because of vaginal bleeding.

The past history was uneventful except for one previous pregnancy, with abortion at two and one half months, about one year prior to admission. No definite objective examination of the circulatory system had been made prior to admission.

except that the eyegrounds had been reported normal by the Eye Outpatient Department in October 1929

The present illness started about the fifth month of pregnancy, with urinary frequency, malaise and severe headaches. Severe pain in the lower part of the abdomen, with vaginal bleeding, brought the patient to the hospital. Examination revealed a six month pregnancy with abruptio placentae. There was slight edema of the face and ankles. The blood pressure

showed marked arteriosclerotic changes. In addition there was a widely spread chronic and subacute inflammatory process throughout the interstitial tissue of the kidney. Acute change, commonly referred to as those of acute exacerbation, consisting of hemorrhage as well as exudation of leukocytes into the remaining glomerular spaces and tubules, were present. Bacterial cultures made by grinding up several grams of renal tissue, which was then smeared out on blood agar plates were sterile. Past experience has taught us that no bacteria are directly associated with inflammatory changes such as those described.

The relationships of the renal changes and the elevation of blood pressure to the repeated pregnancies in this case are of especial interest. It is interesting that during a pregnancy two years previous to the patient's death the blood pressure was 180 systolic, 120 diastolic and that albumin and numerous red and white blood cells were found in the urine, which had a specific gravity of 1.016. On termination of the pregnancy the blood pressure fell to 128 systolic, 80 diastolic. At this time the urine was found to have a fixed specific gravity by concentration test of from 1.002 to 1.006.

That neither a cardiovascular nor a renal syndrome need follow all toxemias of the later months of pregnancy is well indicated in an eleven year study of case 3.

CASE 3 (chart 5)—A Negro girl, aged 17, who first entered the hospital in October 1924, for tonsillitis, and again the following year, with no demonstrable disease, returned two years later in labor, at full term, in her first pregnancy. The day of admission she had two convulsions. There was a history of headache and edema of the feet during the past few weeks but no previous convulsions.

Examination on admission showed edema of the face and eyelids. The lungs were clear. The heart was not enlarged, the rhythm was normal and there was a faint systolic murmur at the apex. The blood pressure was 210 systolic, 138 diastolic. Slight but definite edema of the feet and ankles was present. After delivery the blood pressure fell gradually, the albuminuria cleared up slowly and the patient improved symptomatically.

The patient returned to the hospital in 1928, 1930 and 1932 with second, third and fourth pregnancies. Each was accom-

panied by mild toxemic symptoms and elevation of the blood pressure prior to delivery, with subsequent return to normal.

Slight albuminuria occurred in the second pregnancy but not in any other or in the late follow up record. The heart has remained normal in size, and there have been no abnormal retinal changes.

Known to have normal blood pressure prior to the first pregnancy, this Negro girl had four successive pregnancies with late toxemia but no evidence of

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Chart 4—Clinical course in case 2

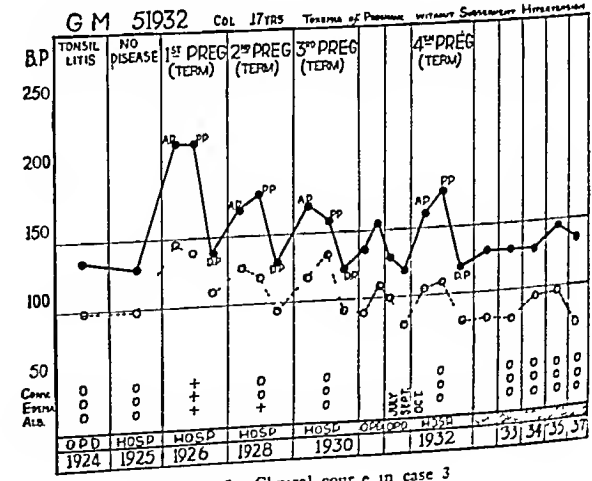
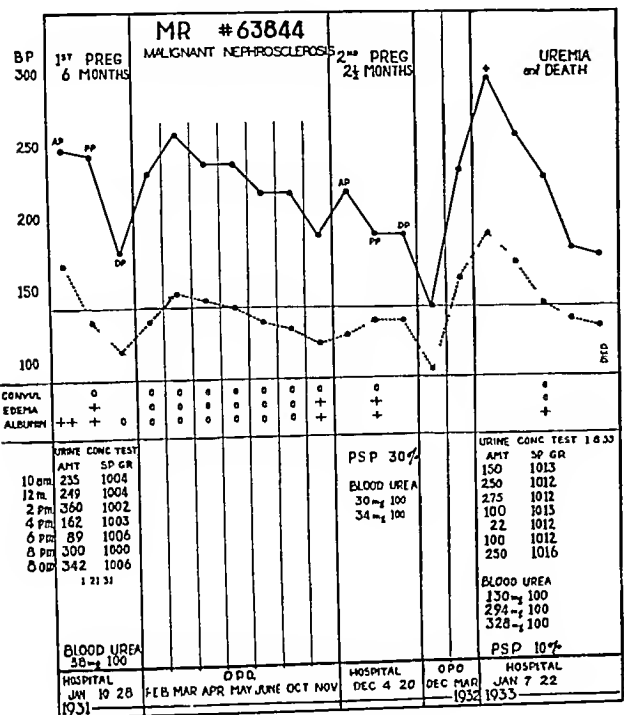


Chart 5—Clinical course in case 3

vascular disease, either cardiac or renal, in the eleven years after the first and five years after the last pregnancy

These examples serve to illustrate the necessity for frequent and detailed observations after the hypertensive toxemias of pregnancy

Herrick and his co-workers have been particularly zealous and careful in their follow-up studies of the hypertensive toxemias of pregnancy. They have developed the thesis, first, that pregnancy may accelerate the rate of progression of hypertensive vascular disease and, second, that it may be associated with the beginning of this syndrome. That pregnancy may be associated with both the onset and the acceleration of existing essential hypertension was brought out by Corwin and Herrick⁵ in 1927. In a clinical study of 339 patients with toxemia they found evidence of hypertensive cardiovascular disease in 73.2 per cent observed from six months to six years after the toxemia. Herrick and Tillman⁶ in general substantiated this in a larger follow-up study of 594 patients with hypertensive toxemia of pregnancy, indicating that 50 per cent had evidence of hypertensive cardiovascular disease within an average of five and one-half years after the discovery of toxemia. Still more convincing is another study by Herrick and Tillman,⁶ in which they observed 188 patients with mild toxemia of pregnancy. These patients had antepartum blood pressure not exceeding 150 systolic, 90 diastolic, a small amount of albumin no convulsions and no disturbances of renal function. Subsequently 33.5 per cent showed hypertension. Thus it would seem that even the milder forms of hypertensive toxemia may be associated later with some degree of hypertension.

This discussion does not purpose to include the role of the kidney in the late toxemias of pregnancy, but no group of patients with hypertensive toxemia of late pregnancy can be discussed without some reference to this phase of the problem.

As pointed out by Zimmerman and Peters,⁷ a variety of vascular or renal diseases may act as predisposing causes for hypertensive toxemia of pregnancy. Clinical precision as to the nature of the renal disturbance is often sadly lacking. Whatever has been called chronic nephritis in the past does not invalidate the fact that renal insufficiency, either previously existing or occurring with pregnancy, offers a severe prognostic hazard. Stander and Peckham⁸ found a maternal mortality of 42.5 per cent within ten years in their pregnant patients with "chronic nephritis," a rate some five and a half times the average mortality for women of the same age group. No doubt some of these cases might now be classified differently, but in any event the unfavorable effect of pregnancy on renal insufficiency can be accepted. Somewhat more disturbing is the recent work of Elden, Sinclair and Rogers,⁹ who found that about 50 per cent of their preeclamptic patients and 67 per cent of their eclamptic patients showed evidence of renal damage by urea clearance studies three months after delivery. The exact clinical significance of this study

is not clear, and prolonged observation would be necessary to establish the meaning of these results. Clinically the outlook for pregnant patients with renal damage is consistently poor, while the chance that patients with severe toxemia of pregnancy will acquire some renal damage must also be considered.

Since pregnancy may accelerate renal disease and hypertensive vascular disease in some cases and apparently not in others, can it be predicted by any known means when the prognosis is unfavorable and when one pregnancy should preclude another? Aside from repeated examination of the blood pressure, here discussed, several associated procedures deserve brief mention.

1 Established renal insufficiency definitely precludes further pregnancy and almost invariably indicates early abortion to prevent further damage to the kidneys.¹ Disturbance of renal function is not always easy to determine, but it seems clear from several sources¹⁰ that the urea clearance is the best test for this purpose. It should be remembered that urea clearance values have a wider range for normal pregnant than for normal nonpregnant women.¹¹ Even this procedure is said to be of doubtful value for the study of renal function during the acute phases of preeclampsia or eclampsia.⁹ Renal function tests have two values: first, the discovery of existing nephritis during pregnancy and, second, the examination of renal function several months after delivery.⁹ Should examination at either time show impairment, further pregnancy would be unfavorable. The Volhard concentration test has proved quite helpful to us before and after pregnancy but has obvious disadvantages during gestation.

2 While the spastic lesions of the retinal arterioles are a frequent and early sign in the hypertensive toxemias of pregnancy,¹² they do not always predict subsequent hypertensive vascular and arteriolar renal disease unless relatively advanced. According to Wagener,¹² hypertension persists when organic retinal lesions develop. Severe changes in the eyes early in pregnancy do spell a subsequent arterial and renal syndrome. However, just when the spastic areas in retinal arteries may be considered dangerously near organic thickening is difficult to say. It is clear, however, that failure of spasm of the retinal arteries to clear up after delivery would be added weight against subsequent pregnancy, while thickening of the retinal artery and retinitis definitely indicate generalized vascular injury, to which the strain of pregnancy should not be added.

3 After the introduction of the cold pressor test of Hines and Brown,¹³ Randall and his co-workers¹⁴ sought to apply this principle to selection of patients in early pregnancy who would show hypertensive toxemia later. In preliminary reports these observers claimed little success, finding that only 33 per cent of the women with an exaggerated "cold pressor" reaction later showed hypertensive toxemia of pregnancy. In our study of sixty-five cases of pregnancy in which we used

5 Herrick W W and Tillman A B J. Toxemia of Pregnancy. Its Relation to Cardiovascular Renal Disease. Clinical and Necropsy Observations with Long Follow Up. Arch. Int. Med. 55: 643 (April) 1935.

6 Herrick W W and Tillman A B J. The Mild Toxemias of Late Pregnancy. Their Relation to Cardiovascular and Renal Disease. Am. J. Obst. & Gynec. 31: 832 (April) 1936.

7 Zimmerman H M and Peters J P. Pathology of Pregnancy. Toxemia. J. Clin. Investigation 16: 397 (May) 1937.

8 Stander H J and Peckham C H. Nephritis Complicating Pregnancy. Am. J. Obst. & Gynec. 22: 626 (Oct.) 1931.

9 Elden C A, Sinclair F D Jr and Rogers W C. The Effect of the Toxemias of Pregnancy on Renal Function. J. Clin. Investigation 15: 317 (May) 1936.

10 Stander H J, Ashton Paul and Cadden J R. The Value of the Various Kidney Function Tests in the Differentiation of the Toxemias of Pregnancy. Am. J. Obst. & Gynec. 23: 461 (April) 1932. Cadden J F and McLane C W. A Study of Various Kidney Function Tests in Relation to the Toxemias of Pregnancy. Surg. Gynec. & Obst. 59: 177 (Aug.) 1934. Elden Sinclair and Rogers.

11 Elden C A and Cooney J W. The Addis Sediment Count and Blood Urea Clearance Test in Normal Pregnant Women. J. Clin. Investigation 14: 889 (Nov.) 1935.

12 Wagener H P. Arterioles of Retina in Toxemia of Pregnancy. J. A. M. A. 101: 1380 (Oct. 28) 1933.

13 Hines E A Jr and Brown G E. A Standard Test for Measuring the Variability of Blood Pressure. Its Significance as an Index of the Preeclamptic State. Ann. Int. Med. 2: 209 (Aug.) 1933.

14 Randall L V, Murray S E and Muey R D. The Cold Test in Pregnancy. A Preliminary Report of Its Use in Prenatal Care. Am. J. Obst. & Gynec. 29: 262 (March) 1935.

this test, several obvious objections to it arose. Sixteen patients showed marked variation of response during pregnancy, while in nonpregnant persons the pressor response is generally quite uniform. Ten pregnant patients had high response values, theoretically predicting later hypertension which did not appear, and seven had normal pressor responses which failed to predict a later hypertensive toxemia. Only four correct predictions occurred, and two of these patients had preexisting vascular disease. The doubtful value of this test in pregnancy and its failure to predict the hypertensive toxemias of pregnancy have also been brought out by other observers.⁴ We have already indicated in a previous brief report¹⁵ our further doubts concerning the accuracy of the cold pressor test for the selection of "potential" candidates for subsequent hypertension. Pickering and Kissin¹⁶ have expressed a similar view.

If the renal function is normal the question of additional pregnancy following late toxemia may be open to debate. In view of our limited knowledge it is probably advisable to prohibit further pregnancy after late hypertensive toxemia. However, other cases similar to case 3 in this report undoubtedly exist. Some women with hypertensive toxemia can have more than one pregnancy without subsequent vascular disease, but no single diagnostic method is available by which such women may be selected. Repeated observations of the blood pressure for at least a year after delivery will generally indicate beginning vascular disease. A single observation of the blood pressure is often misleading and may show normal values in cases of established vascular disease.

SUMMARY AND CONCLUSIONS

A study of 500 patients with late toxemia of pregnancy shows that age is directly related to the incidence of early postpartum hypertension. This suggests that age may be an important factor in the later development of the hypertensive syndrome.

Definite derangement of renal function is the most important contraindication of further pregnancy after late toxemia. If renal function is normal after late toxemia, then repeated observations of the blood pressure, study of the retina and a consideration of the age factor help to determine the advisability of further pregnancy.

Box 1213

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. PETERS AND DRs. WOOD AND NIX

DR. JOSEPH M. HAYMAN, JR., Cleveland. The etiology of toxemias of pregnancy is one of the most debated problems of medicine. They are attributed to such diverse causes as syncytial cells in the maternal blood stream, to congenital endocrine dyscrasia, to guanidine derived from placental infarcts due to the kick of an impatient fetus, to inadequate, low vitamin diet, and to an unknown toxin. In such a dilemma it is comforting to have evidence of the importance of vascular disease, nephritis and pyelitis. That these are of importance is not a new view. It has impressed other internists who have studied the problem but is not popular with the obstetricians. That these conditions are exaggerated and are modified and have their features somewhat changed by pregnancy is clear. Gross and microscopic changes in the ureter and some degree of dilatation have been found in every pregnancy. With the association of outspoken pyelitis and toxemia, this suggests the importance

of examining the urine for other elements besides albumin in an effort to define the normal more closely, and to predict if possible those who will develop symptoms from the pyelitis. I have seen an apparently cured pyelitis during early pregnancy flare up after delivery, associated with eclampsia, and represent the only lesion found post mortem. Recurrent attacks of pyelitis in succeeding pregnancies are common. Drs. Wood and Nix have spoken of the confusion due to the obstetric diagnosis of nephritis. This is usually based on an elevated blood pressure and albumin, primary vascular disease not being recognized. Certainly a woman with a true glomerular nephritis who becomes pregnant is running a grave risk, if allowed to go to term, provided she survives, she will in all probability have suffered marked impairment of function. These women however, show low clearance early in pregnancy, in contrast to the vascular group, in which function tests may be normal even in the presence of definite symptoms. A pregnant woman with primary vascular disease is like a nonpregnant woman with the early stages of primary vascular disease. Only when the cause of malignant hypertension in the nonpregnant is known will one be in a position to determine whether there is an essentially different etiology in the pregnant. Certainly both Dr. Peters and Drs. Wood and Nix have shown the folly of classifying toxemias on a basis of symptoms to the neglect of recognizable pathologic processes, modified and accelerated although these may be by the presence of pregnancy. Only by such recognition can progress be expected in treatment, and in reducing the high mortality and morbidity that follow toxemias in late pregnancy.

DR. SOMA WEISS, Boston. The descriptions of toxemias have been characterized by lack of clarity because a number of unrelated conditions have been brought together and presented as a composite picture. Syndromes such as uremia, hypochloremia, cholemia, acidosis, alkalosis, cerebral encephalopathy, vasomotor collapse, shock and psychosis arising from such different underlying diseases as pyelonephritis, glomerulonephritis, nephrosclerosis, arterial hypertension, pernicious vomiting, hepatitis and nutritional deficiency have been grouped as related "toxemias" of pregnancy. Dr. Peters has indicated that renal and vascular disorders play a particularly frequent role in causing serious complications. Hepatic disturbance less frequently causes serious syndromes. There are patients in whom dangerous dysfunctions develop but in whom no organic lesions and no uniform chemical or physiologic changes can be found. Pressure of the uterus on the ureters and on the renal veins frequently interferes with the renal function and circulation and may induce or aggravate local infections. Vomiting may be responsible for hypochloremia, azotemia and hypoproteinemia and may result in nutritional disturbances. These factors alone but particularly in association with vascular, renal and hepatic disease, may lead to cerebral edema, uremia, vascular crisis, psychosis and excitability of the nervous system. The pronounced changes in the function of certain glands of internal secretion can also alter water metabolism and vascular and nervous responses, particularly in patients with a tendency to vasospasm and renal insufficiency. It is of particular significance that each syndrome observed in toxemias of pregnancy can be found in male patients suffering from certain renal, vascular, hepatic or deficiency diseases, particularly if the water, salt and protein contents of the blood and the glands of internal secretion are disturbed. As Dr. Peters and Drs. Wood and Nix have indicated, toxemia of pregnancy is not one disease, hence it cannot have one cause, one mechanism or one type of treatment. It also follows from what has been said that manifestations of certain diseases brought to the clinical surface by pregnancy, such as those of glomerulonephritis, pyelonephritis or essential hypertension, may partially or completely subside after pregnancy only to reappear years later, other diseases such as liver damage and deficiencies on the other hand may completely disappear after pregnancy. The characteristics of each underlying disease and presence of the precipitating factor will determine the probability of recurrence of a toxemia.

DR. JOHN P. PETERS, New Haven, Conn. One point I should like to emphasize, especially in the light of the charts of Drs. Wood and Nix, is the fallacy of assuming because the blood pressure is normal at any one time that the patient is

15 Yates M. R. and Wood J. E. Jr. Vasomotor Response of Non-hypertensive Individuals to a Standard Cold Stimulus. *Proc. Soc. Exper. Biol. & Med.* 34: 560 (May) 1936.

16 Pickering G. W. and Kissin M. Effects of Adrenalin and of Cold on Blood Pressure in Human Hypertension. *Clin. Sc.* 2: 201 (May) 1936.

free from disease. It is too common to discharge patients from the hospital and say they are all right because their blood pressure is normal. As the charts show, there is a sudden drop after pregnancy lasting about two weeks. This is due to the fact that the patients are in bed during those two weeks and are inactive, and that the recurrence of hypertension afterward is due to the fact that they are up and active. Another point I wish to make is that when a high blood pressure has been found by one man and the next man finds it a week later entirely normal, the man that found it normal says it is functional. I have not yet been able to assure myself that my powers as a clinician are such as to allow me to distinguish between fixed or anatomic and functional hypertension. I do know that these patients come back in a very short time with obvious disease, and that the blood pressure is then fixed. I am sure that in some of my cases at autopsy arteriosclerosis of a most profound nature had existed for a long time when the patients were spoken of as having functional blood pressure changes because at the time, and especially when they were at complete rest, the blood pressure was found normal.

Dr J. EDWIN WOOD JR., University, Va. Dr Peters is quite right concerning the importance of blood pressure variation. A single blood pressure observation following the late toxemia of pregnancy is of very little value and two or three years with repeated examination may be necessary to determine the question of vascular disease following the late toxemia of pregnancy. The advisability of subsequent pregnancy following a late hypertensive toxemia is at best difficult to decide. No specific method is available for the selection of those who will do well. Repeated blood pressure and renal studies with a consideration of the age factor form the present general basis for decision.

CHRONIC MERCURIALISM IN THE HATTERS' FUR-CUTTING INDUSTRY

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Approximately 2,000 men and women were employed in the fur-cutting industry in 1934, preparing the fur of rabbits and hares so that it could be used subsequently in the manufacture of felt hats. At an early stage in the manufacturing process the pelts are treated with a solution containing mercury dissolved in nitric acid, and at every later stage workmen are exposed to mercury vapor arising from the mercury-treated fur. It has long been known that cases of chronic mercurialism occur in this industry, but there has hitherto been no information concerning the proportion of fur cutters who were affected, and there has likewise been no information concerning the relation between exposure to mercury vapor and the incidence of chronic mercurialism.

To help remedy this lack of information a medical and engineering study of five representative fur-cutting factories employing 529 persons was made by members of the Office of Industrial Hygiene and Sanitation of the United States Public Health Service during the winter and spring of 1935.

MERCURY EXPOSURE

The occupational groups in which chronic mercurialism occurred are listed in table 1 in order of the percentage of workers who were affected.¹ The

average mercury exposure for these groups is listed in the last column. It will be noted that the incidence of chronic mercurialism runs roughly proportional to the concentration of mercury vapor.

Of course, the concentration of mercury in the air of the workroom depends on the extent to which control measures are practiced. Where two values for the concentration of mercury vapor are given, the higher one represents average values for plants in which no provision was made for ventilation and the lower one represents averages for plants in which control measures were in use.

Every employee of the five factories studied was exposed to measurable concentrations of mercury vapor and fur dust, therefore the persons who were not affected by mercury exposure cannot properly be called a control group. It was not possible to make a study on another group of people for controls.

PROCEDURE IN MAKING MEDICAL EXAMINATIONS

In this study 529 men and women fur cutters were examined in rooms or portions of rooms provided by the factory management. They were examined during the working day, one or two at a time, as they were sent in by the foreman. Two physicians examined each person. A nurse was present and assisted in the examination of all women employees. The laboratory examination of blood and urine was made in a field laboratory set up in the factory.

In recording the occupational history of each worker an effort was made to include (1) his present occupation and the length of time he had been engaged in it, (2) every type of work he had performed in the fur-cutting industry and the length of time he was so employed, (3) a record of all the occupations in other industries he had worked at from the time he first began to work and (4) an estimate of the total time he had been employed. As a result it is possible to say that, so far as can be ascertained from their own statements, none of these employees had previously worked in an industry other than the hatting trades in which it is known that workmen are exposed to appreciable quantities of mercury, and none of those whose condition was diagnosed as chronic mercurialism received any appreciable mercury exposure except in the fur-cutting industry.

After the data obtainable by questioning had been recorded, the subject's height and weight were measured, and an examination of eyes, ears, nose and throat was made. Special attention was given to the mouth, because of the frequency with which oral disease is mentioned in the literature of chronic mercurialism. Blood pressure was measured with a standard mercury sphygmomanometer. Pulse rate and respiratory rate were recorded. The subject was stripped to the waist, and the condition of the skin and the presence or absence of occupational stigmas was noted. Examination of the chest consisted of inspection, palpation, percussion and auscultation of the heart and lung fields. A fluoroscopic examination of the chest was made, and a flat film was prepared for subsequent study. Special attention was exercised in testing the various nervous reflexes and other neurologic signs.

Samples of blood for microscopic study and for determination of the hemoglobin were taken from an ear lobe or from a finger tip. Samples (from 6 to 10 cc.) for chemical analysis were drawn from the median basilic vein. Samples of blood serum were inactivated by heating at 56 C. for twenty minutes and were mailed

¹Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1937.
²A description of the processes involved in the manufacture of hatters' fur will be found in Bull. 234 U. S. P. H. S. to be published.

either to the National Institute of Health or to the Connecticut State Department of Health so that Kahn and Wassermann tests could be made

Each person was given a container in which he was asked to bring a twenty-four hour sample of urine. On this sample, in addition to the standard chemical and

quantitatively noted among the persons who were considered to have chronic mercurialism

Specific inquiry concerning the possible presence of a number of other pathologic conditions was made of each person examined. None of these conditions occurred with sufficient frequency to warrant inclusion in the tables

TABLE 1—Incidence of Chronic Mercurialism in Various Occupations Within the Fur-Cutting Industry

Occupation	Cases of Chronic Mercurialism		Number of Persons Employed in Occupation	Average Mercury Exposure Mg per 10 Cubic Meters
	Percentage	Number		
Total all occupations	8	43	529	
Blowers	73	11	15	4.6
Shippers	50	3	6	7.2
Brushers	14	3	22	12.31
Blown fur packers	11	1	9	3.8
Yellow carrot dryer	11	1	9	2.0
Cutters	10	5	48	18.40
Clippers	9	5	56	0.715
Sprenders	7	2	29	0.912
Sorters	4	8	178	1.735
Miscellaneous	7	4	57	0.6

microscopic tests, quantitative spectrographic estimations of the mercury content were made

Of the 529 persons examined, forty-three were considered to have chronic mercurialism

PAST MEDICAL HISTORY

The past medical history revealed little to distinguish these fur cutters from other industrial workers, except for the history of past attacks of nervous and mental disorders. Although stomatitis has frequently been reported by physicians who have made physical examinations on hatters and fur cutters, only five persons were found who were able to recall attacks of ulcerative inflammation of the mouth, and not one of these five was in the mercury-affected group

PRESENT COMPLAINTS

As in the past medical history, the most conspicuous difference between the two groups concerns the functioning of the nervous system. Of the affected fur

TABLE 2—Number and Percentage of Fur Cutters Reporting a History of Certain Diseases and Physical Defects

Past Medical History	Percentage		Number	
	Chronic Mercurialism	No Diagnosis of Chronic Mercurialism	Chronic Mercurialism	No Diagnosis of Chronic Mercurialism
Total	100.0	100.0	43	486
Diseases of nervous system	30.2	4.1	13	20
Operations requiring hospitalization	20.9	29.1	9	142
Diseases of digestive system	16.3	13.8	7	67
Disabling colds	14.0	11.5	6	56
Diseases of urinary system	4.6	4.3	2	21
Pneumonia	4.6	6.8	2	33
Stomatitis	0.0	1.0		5

cutters, 37.2 per cent were aware that they had nervous disorders that interfered with their activity. The disorders complained of were excessive timidity, embarrassment in the presence of strangers and irritability. Digestive disturbances, insomnia, loss of appetite, tremor, loss of weight and sore mouth were more fre-

PHYSICAL SIGNS²

Pallor—Slight or moderate pallor was observed more frequently in persons with the symptoms of mercurialism than in other persons (18.6 per cent as compared with 1.2 per cent). Persons with pallor had slightly lower erythrocyte and hemoglobin values than other persons. Pallor was observed less frequently and was less marked than in the case of lead poisoning

Conjunctiva—All of the cases of inflamed conjunctiva were of the relatively mild, noninfective type, resembling the inflammation produced by irritation. It is difficult, if not impossible, to trace the cause of this inflammation to a specific irritant present in measurable amount in the working environment

TABLE 3—Number and Percentage of Fur Cutters Who Complained of Certain Conditions Present at the Time of Examination

Present Complaint	Percentage		Number	
	Chronic Mercurial Poisoning	No Diagnosis of Chronic Mercurial Poisoning	Chronic Mercurial Poisoning	No Diagnosis of Chronic Mercurial Poisoning
Total	100.0	100.0	43	486
Psychic disturbances	37.2	4.3	16	21
Digestive disturbances	23.3	7.4	10	36
Insomnia	20.0	5.8	9	23
Loss of appetite	16.3	2.3	7	16
Tremor	14.0	0.8	6	4
Admittedly excessive use of alcohol	11.6	10.3	5	50
Loss of weight	11.6	1.0	5	9
Sore mouth	0.2	1.6	4	8
Weakness	4.7	2.3	2	11

Ears and Nose—The percentage of fur cutters found to have chronic otitis media, perforated ear drum and defective hearing was approximately the same as that found for other industrial employees, however, a higher percentage of fur cutters were found to have simple inflammation of the nasal mucous membranes

Mouth and Throat—Among fur cutters, the incidence of pathologic conditions of the mouth is uniformly higher for persons with tremor and allied symptoms than for other persons. None of the severer forms of disease that have occasionally been attributed to chronic mercurialism (such as ulcerative mercurial stomatitis, the loss of large numbers of teeth and severe degrees of pyorrhea) were observed in these fur cutters. It is obvious that their general living conditions and possibly the extent to which they practiced oral and dental hygiene may have had a great deal to do with the occurrence of these conditions. In the case of pathologic conditions that are as diversely described and interpreted as these, it is not surprising to find great differences in the incidence in the published reports of different physicians. Consequently, it is difficult to decide what the incidence in a "normal" population might be. Many of the conditions listed

² For detailed statistical analysis see Table 234 U. S. I. H. S. to be published

in table 4 as disorders of the mouth and throat represent different degrees of damage to the oral cavity which may be merely stages in a general pathologic process

Gingivitis (including both pyorrhea and inflammation of the gums in which exudation of pus was not demonstrable) was somewhat more prevalent among persons with chronic mercurialism than it was among other persons

A tabulation of the percentage of men and women in different age groups shows that the incidence of gingivitis increases with age. For persons between 30 and 50 years, the incidence of gingivitis in the mercury-affected group is higher than the average for those ages. The incidence of gingivitis appears to have no direct relation to the degree of mercury exposure.

Two kinds of discoloration of the oral and nasal cavities were observed, one of them white and one of them a rich, coppery color. With both the membrane was dry and glistening, and, when present, the condition usually extended over the entire oral mucous membrane as far as the upper portion of the pharynx and the vestibular portion of the nasal mucous membrane. The coppery discoloration has been mentioned frequently by writers on chronic mercurialism, the white discoloration has been less frequently discussed. These conditions were found most often in persons exposed to a combination of high concentrations of mercury vapor and large amounts of fur dust, among blowers and blown-fur packers, for instance. They were also associated with tremor and allied symptoms.

Six men and one woman, all of whom had fine intention tremor, had a dark line on their gums closely resembling the Burtonian line of lead poisoning. This line, which has been noted and variously described by almost every physician who has published an account of chronic mercurialism, appeared as a narrow, irregular row of closely set, bluish black dots running roughly parallel to the gingival margins. The persons in whose mouths dark lines were found had no more and no less than the usual number and degree of pathologic conditions of the mouth. Four (three of them blowers) were working in air containing more than 2.5 mg. of mercury vapor per 10 cubic meters at the time of the study, which represents more than an average exposure to mercury. The shortest length of employment in the fur-cutting industry resulting in a dark line on the gums was two and one-half years.

Excessive salivary flow, long considered to be a cardinal symptom of chronic mercurialism, was observed in ten fur cutters, all but three of whom were working in atmosphere containing more than 2.5 mg. of mercury vapor per 10 cubic meters of air.

No cases of ulcerative stomatitis, which has been regarded by some writers as a symptom of chronic mercurialism, were found.

Glands—No cases of generalized glandular enlargement were found.

Thyroid—There was no discernible relation between thyroid enlargement and duration of employment in the fur-cutting industry, either in men or in women. Examinations to ascertain the presence of thyroid enlargement were made in accordance with the procedure recommended by Olesen,³ which takes into account small deviations from normality. The rate for men (81 per cent) and for women (13.9 per cent), based on all of the 298 men and 231 women examined,

are not particularly high, when such comparative data as are available are taken into account.

The absence of an unusual prevalence of enlarged thyroid is important because of a possibility that the tremor observed might have been caused by a thyroid disturbance instead of mercury exposure. Only six of the forty-three people afflicted with tremor had enlarged

TABLE 4—Summary of the Results of Physical Examination of 529 Fur Cutters

	Percentage		Number	
	Chronic Mercurial Poisoning	No Diagnosis of Chronic Mercurial Poisoning	Chronic Mercurial Poisoning	No Diagnosis of Chronic Mercurial Poisoning
Total number of persons	81	91.9	43	48.6
Pallor	18.6	1.2	8	6
Eyes				
Defective vision	29.4	11.1	10*	46†
Inflamed conjunctiva	20.9	9.0	9	44
Jaundiced conjunctiva	2.3	2.3	1	11
Ears				
Otitis media	2.3	0.8	1	4
Perforated ear drum	4.6	3.5	2	17
Defective hearing	4.6	3.5	2	17
Nose				
Simple inflammation of nasal mucous membrane	53.5	33.1	23	161
Mouth and throat				
Gingivitis (including pyorrhea)	46.5	36.6	20	178
Dry white discoloration of mucous membrane	37.2	23.5	16	124
Dry coppery discoloration of mucous membranes	11.6	4.7	5	23
Extensive dental repair	25.6	16.9	11	82
Dental caries	16.3	16.0	7	78
Six or more teeth missing	32.6	3.9	14	19
All teeth missing	9.3	1.4	4	7
Chronic tonsillitis	4.7	6.8	2	33
Excessive salivary flow	14.0	0.8	6	4
Dark line on gums	16.3		7	0
Mercurial stomatitis			0	0
Glands				
Enlarged thyroid gland	14.0	10.3	6	50
Enlarged cervical glands		0.2	0	1
Enlarged epitrochlear glands	7.0	3.3	3	16
Enlarged axillary glands		1.0	0	5
Enlarged submaxillary glands		0.6	0	3
General adenopathy		3.5	0	17
Heart				
Valvular heart disease		1.0	0	5
Lungs				
Persistent coarse râles	7.0	1.2	3	6
Fine moist râles			0	0
Nervous system				
Fine intention tremor of any part of body	100.0		4*	0
of fingers	79.1		34	0
of eyelids	62.8		27	0
of tongue	46.5	0.0	20	0
of other members	25.0		11	0
as shown by shaky signature	37.2	5.5	16	22
Psychic irritability	79.1	1.0	34	5
Speech defect	18.0	0.4	8	2
Exaggerated knee jerk	20.9	4.3	9	21
Positive Romberg test	2.3	0.4	1	2
Dermatographia	11.6	0.8	5	4
Abnormal blushing	25.0	0.2	11	1
Excessive perspiration	11.6	0.2	5	1

* Thirty-four persons tested

† Four hundred and nineteen persons tested

thyroid, a proportion only a little higher than for persons who did not have tremor. Four of these poisoned subjects were 1+ and two were 2+ according to Olesen's classification.

Chest—In the older medical literature dealing with the fur-cutting industry the belief was frequently expressed that pulmonary tuberculosis is more prevalent than usual in this industry. Also, since large amounts of fur dust are in suspension in the air of the workrooms, it seemed desirable to ascertain whether disease

3 Olesen Robert. Endemic Goiter. Bull 192 U S P H S 1929

of the lungs was present which could be attributed to dust exposure. Accordingly, each person was subjected to a fluoroscopic examination of the chest, and a flat roentgenogram was made for subsequent study.

Roentgenologic evidence of active pulmonary tuberculosis was not observed in any of the persons studied. There was no indication that exposure to fur dust had resulted in any detectable disease of the lungs.

Tremor—In the differential diagnosis of mercurial tremor the possibility that the tremor was due to multiple sclerosis, paralysis agitans, exophthalmic goiter, chronic alcoholism or senility was considered. These conditions can be excluded because their other symptoms were absent in the forty-three persons who were considered to have mercurial tremor. Thus, these persons did not have the diminished abdominal reflexes, nystagmus or bladder symptoms characteristic of multiple sclerosis. Paralysis agitans is accompanied by a characteristic masklike expression, and its tremor is not wholly an intention tremor. The absence of a direct relationship between thyroid enlargement and tremor has already been discussed, and that circumstance, together with the absence of exophthalmos and other characteristic signs, eliminates the possibility that the tremor may have been due to exophthalmic goiter. The tremor due to senility rarely begins before the age of 70. The tremor associated with chronic alcoholism is finer, continuous and more regular than the mercurial tremor.

Fine intention tremor has a twofold significance. It is not only a frequent sign of chronic mercurialism, but, in its advanced stages, it becomes disabling. There is general agreement on the characteristics of mercurial tremor. As it was observed in forty-three fur cutters, it is a fine intention tremor, that is, it is a rhythmic trembling movement of slight amplitude, from five to eight movements a second, which increases in extent when the subject attempts voluntary movements. It affected the two sides of the body equally. It was most frequently observed in the hands and fingers. Next in order of frequency came tremor of the eyelids, tongue, arms, cheeks, lips, forehead, head and legs. Only one case was observed in which the entire body was affected.

Psychic Disturbances—A diagnosis of psychic irritability was made when a person had several of the following characteristics in abnormally exaggerated degree: irascible temper, discouragement without cause, feeling of depression or despondency, excessive embarrassment in the presence of strangers, timidity, a desire for solitude, anxiety, excitability, inability to take orders or a strong feeling of self-consciousness.

The difficulties in making appraisals of this kind are so obvious that they need no discussion. Any of these characteristics can be found in persons who have had no known mercury exposure whatever, and psychiatric literature is filled with discussions of the various causes of disturbed mental states such as these. Four facts can be adduced to show that these disturbances actually were a consequence of exposure to mercury. 1 They were closely connected with other symptoms of chronic mercurialism, 79 per cent of the people who had fine intention tremor had psychic disturbances also, and only five persons who did not have discernible mercurial tremor had exaggerated mental disturbances. Moreover, there was a direct parallelism between the degree of tremor and the degree of deviation of the subject from normal standards of behavior, the advanced stages of tremor usually being accompanied by the most abnormal psychologic states. 2 These phenomena have been

noted by almost every writer on chronic mercurialism in modern times. Indeed, certain physicians have gone so far as to regard psychic disturbances as the earliest and most characteristic symptom of chronic mercurialism resulting from exposure to low concentrations of mercury. 3 Disorders of this kind have been reported to be prevalent in industries which manufacture or make use of mercury but which differ from one another in most other respects. 4 There is a close relation between mercury exposure and the occurrence of psychic disturbances. Without attempting to make allowances for duration of exposure, because of the relatively small number of cases with which we have to deal, one may find the following data instructive. Of the 107 workers exposed to less than 1 mg. of mercury vapor per 10 cubic meters, four (or 3.7 per cent) had psychic disturbances, of the 278 persons exposed to more than 1 but less than 2.4 mg. per 10 cubic meters, ten (or 3.6 per cent) were so affected, of the 144 persons exposed to more than 2.5 mg. per 10 cubic meters, twenty-five (or 17.4 per cent) had psychic disturbances.

A distinctive type of speech defect was found frequently among persons with tremor and allied symptoms. This defect, often referred to as scanning speech, is characterized by a slight or moderate slurring of words, hesitancy in beginning sentences, and a kind of difficulty in pronunciation that is quite different from the difficulties encountered in speaking an unfamiliar language.

Knee Jerk—Exaggerated knee jerk was found about five times as frequently among persons with chronic mercurialism as among other persons.

Vasomotor Disorders—Red, stable dermatographia, excessive perspiration and abnormal readiness to blush were particularly common among persons who were exposed to the higher concentrations of mercury vapor and among persons who had the symptoms of chronic mercurialism.

Other Disorders—Structural anatomic defects, such as hernia, varicose veins, ankylosed joints, muscular atrophy and missing members, were found infrequently.

The blood pressure of the fur cutters was essentially normal.

BLOOD PICTURE

The average erythrocyte count and hemoglobin content were slightly lower for the fur cutters who had the symptoms of chronic mercurialism than for other persons. The reticulocyte value was a little higher than usual for men with chronic mercurialism but the extreme values sometimes found in cases of lead poisoning did not occur.

Estimates of the relative abundance of stippled cells were made, none were found in the blood of 77 per cent of the men or of 72 per cent of the women, few persons had numbers of stippled cells of pathologic significance, and there were no indications that stippling was associated with the symptoms of chronic mercurialism. Similar statements may be made for estimates of the blood platelets. Observations on the occurrence of anisocytosis and achromasia did not indicate that they are at all closely linked with mercury exposure or the symptoms of chronic mercurialism.

No relation could be found between mercury exposure and the leukocyte count. Persons with the symptoms of chronic mercurialism had almost the same total leukocyte count as persons who did not have these symptoms.

The percentages of lymphocytes in the blood of these fur cutters were slightly higher than usual, and the percentages of neutrophils were correspondingly lower than usual. Although the interpretation of these differences is complicated by several circumstances which could not be controlled, it does not appear that they are necessarily the result of absorption of mercury. The fact that the percentages of monocytes were within normal limits substantiates this view.

The nonprotein nitrogen, the creatinine and the sugar content of the blood were determined by the methods of Folin and Wu, and the serum calcium was measured

TABLE 5—Number and Percentage of Men and Women Fur Cutters Whose Urine Contained Mercury

Concentration of Mercury Mg per Liter	Percentage		Number	
	Men	Women	Men	Women
Total tested	100 0	100 0	266	222
Mercury absent	69 9	58 6	186	130
0.01 to 0.39	11 3	25 2	30	56
0.4 to 0.79	16 2	14 9	43	33
0.8 to 1.19	2 2	1 3	6	3
1.2 and over	0 4	0 0	1	0

by the titration method of Tisdall. Most of these values fell within normal limits, and there seems to be no need to present them here.

RESULTS OF CHEMICAL AND MICROSCOPIC EXAMINATION OF URINE

All examinations of the urine were made on twenty-four hour specimens within a few hours after they were received at the field laboratory.

Tests for the presence of albumin were made by the sulfosalicylic acid method described by Kingsbury, Clark, Williams and Post,⁴ and by Blatherwick.⁵ Albumin was found in the urine of eighty-two of the 281 men tested (29.2 per cent) and of fifty-two of the 224 women tested (23.2 per cent). This is a higher incidence of albuminuria than Sydenstricker and Britten⁶ reported for 100,924 white men, namely 21.7 per cent. There was, however, little difference between the percentage of mercury-affected men with albuminuria and that of nonaffected men with albuminuria.

Sugar was found in the urine of only 1.6 per cent of the men, a low incidence. The urinary pigments urobilin and hematoporphyrin were present in the urine of only a few persons. The percentage of persons whose urine contained fine granular casts, leukocytes or erythrocytes was about as high in the group who were not affected by mercury exposure as in the group who were.

MERCURY IN THE URINE

The mercury content of urine was measured by a quantitative spectrographic method.

Mercury was found more frequently in the urine of women than in the urine of men, and the difference is statistically significant.

One might expect to find the highest concentrations of urinary mercury in persons who were exposed to the highest concentrations of mercury vapor, but an

examination of the data shows that such a trend is not at all clearly marked. Statistical probability tests indicate that there is a significant association between the concentration of atmospheric mercury and the concentration of urinary mercury. It is not pronounced enough, however, to warrant a definite statement concerning the relation of these two variables.

It is difficult to draw definite conclusions concerning the relation of the presence of mercury in the urine to chronic mercurialism. If mercury in the urine were an important symptom, then the persons with the most pronounced symptoms of chronic mercurialism should exhibit this characteristic in pronounced degree. However, this does not appear to be the case. Analyses were made on the urine of nine of the ten persons who had the most advanced symptoms of chronic mercurialism. Only three had mercury in the specimen of urine submitted for examination.

There was no indication that the presence of mercury in the urine was associated with kidney disease as evidenced by any of the abnormal urinary constituents.

SYMPTOMATOLOGY OF CHRONIC MERCURIALISM

The most important physical impairments observed in the study in order of prevalence are fine intention tremor, psychic disturbances, exaggerated knee jerks, vasomotor disturbances, digestive disturbances, insomnia, loss of appetite, loss of weight, past history of nervous diseases, present complaint of sore mouth, present history of tremor and present complaint of psychic disturbances.

Not every person with mercurialism presented all of these symptoms. For example, of the forty-three persons who had fine intention tremor (which was regarded as the most important diagnostic sign of chronic mercurialism), only twenty-two had vasomotor disturbances (dermatographia, excessive perspiration or abnormal readiness to blush). Of these twenty-two, six had psychic disturbances. Of these six, three had exaggerated knee jerk.

TABLE 6—Relation of Urinary Mercury to Chronic Mercurial Poisoning in Men Fur Cutters

Diagnosis	Number of Men with			Percentage with Mercury in Urine
	Mercury in Urine	No Mercury in Urine	Total	
Total	80	186	266	
Poisoned	14	19	33	42.4
Not poisoned	66	167	233	28.3

gerated knee jerk. Only one person had tremor, vasomotor disturbances, psychic disturbances, exaggerated knee jerk and digestive disorders. Other tabulations of the data are possible, but the result, in general, is the same, the number of persons who had more than three or four of these symptoms is small. Nevertheless, it must not be supposed that these symptoms occur entirely independently of one another. On the contrary, they are found together significantly often.

Fine intention tremor accompanied other physical impairments far more frequently than one would expect on the basis of chance alone. No other impairment was so frequently associated with so many other disorders and defects, and this is one of the reasons why the tremor was regarded as the most important symptom in establishing the diagnosis.

Psychic disturbances also accompanied many other impairments to an unusual degree.

⁴ Kingsbury, F. B., Clark, Charles P., Williams, Gertrude and Post, Anna L. The Rapid Determination of Albumin in Urine. *J. Lab. & Clin. Med.* 11: 981 (July) 1926.

⁵ Blatherwick, N. R. The Kingsbury-Clark Method for Albumin and the Benedict-Picrate Method for Sugar. *Journal of the American Medical Association* 53: 57-59 (Feb. 1) 1933.

⁶ Sydenstricker, Edgar and Britten, Rollo H. The Physical Impairments of Adult Life. General Results of a Statistical Study of Medical Examinations by the Life Extension Institute of 100,924 White Male Life Insurance Policy Holders Since 1921. *Am. J. Hyg.* 11: 73-94 (Jan.) 1930.

Vasomotor disturbances and exaggerated knee jerk were significantly associated with a number of other impairments, although not to the same extent as fine intention tremor and psychic disturbances.

It is interesting to note that a complaint of digestive disorders present at the time of examination was significantly associated with complaints of other kinds: insomnia, loss of weight and loss of appetite. Digestive disturbances are not frequently associated with the disorders that were found on physical examinations, with the exception of fine intention tremor and psychic disturbances.

CONCENTRATION OF MERCURY VAPOR AND CHRONIC MERCURIALISM

The number of employees exposed to high concentrations of mercury is relatively small, most of them (71.3 per cent) were exposed to less than 2 mg per 10 cubic meters. Patients presenting the symptoms of chronic mercurialism were found over the entire range of mercury concentrations observed in these plants. All but one exposed to the lower concentrations had mild symptoms, and two of the three men exposed to more than 7 mg per 10 cubic meters had severe symptoms, but in the intermediate range the severity of the condition was not always proportional to the concentration of mercury vapor. This is only to be expected, since the duration of exposure was not taken into account. There is a steady increase in the percentage of mercury-affected persons with increasing mercury concentration.

No cases of chronic mercurialism were observed in persons who had been employed for less than two years. It must not be inferred, however, that this length of time necessarily constitutes a safe period of exposure, because sixty of the seventy-five persons who had been employed less than two years were engaged in occupations which exposed them to less than 2.5 mg of mercury per 10 cubic meters, a concentration that does not produce a high rate of incidence (47 per cent) of chronic mercurial poisoning irrespective of the length of exposure.

No cases of mercurialism were found among the forty carroters.

An attempt was made to find out whether or not a direct relation existed between exposure to dust and certain disorders of the respiratory tract and the mucous membranes. The occupational groups were arranged in order of their dustiness, and the percentages of the workers in each occupation who were afflicted with a specific disorder were tabulated and plotted in the same order. Concentration of dust and incidence of these physical defects did not vary concomitantly when inflamed conjunctiva, inflamed nasal mucous membranes, gingivitis, discolored oral mucous membranes, and disease of the lungs demonstrable by the standard methods of physical examination or with x-ray equipment were studied in this way. One occupational group, however, the blowers, had a high incidence of each of these disorders. Besides being exposed to high concentrations of dust the blowers are exposed to high concentrations of mercury vapor.

No particular disturbances of menstruation or of pregnancy were noted among the women fur cutters.

The incidence of syphilis among the fur cutters was low. Kahn and Wassermann reactions were made on 439 persons, seven specimens of blood (1.6 per cent) gave both Wassermann and Kahn reactions of 1 plus or more.

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ABSTRACT OF DISCUSSION

DR. D. CHESTER BROWN, Danbury, Conn. This study is a most thorough one from the aspect of preventive medicine but it does not appeal to the clinician as he already knows that if one prevents the access of the metal to the system there is no chronic mercurialism. Until that is accomplished the clinician wants to know what are the pathologic results of mercury and other metal poisoning. He wants to know why the metal becomes so tightly locked in the system, why the damage in certain phases appears to be permanent and irremediable. He wants to know why metal poisoning progresses, almost symptom free, up to a certain point and then suddenly this condition is precipitated. And then he wants reliable laboratory tests to determine the prognosis in its compensation aspect. This study deals with the fur-cutting industry only, while the mercuric nitrate used in carroting the fur continues well through the operations of making a hat. Now if we enlarge the field of study to include other metals that have some clinical similarity in their manifestations of poisoning, it assumes a magnitude that makes it a field worthy of study. It is perhaps not stating it too strongly to say that any one who has had occasion to refer to medical literature on metal poisoning has been impressed with the meagerness of knowledge in this line. If this excellent study of Drs. Neal and Jones will create an interest that will lead to a combined study by diagnosticians, pathologists and therapeutists of the varying conditions in metal poisoning, I feel sure the results will be gratifying.

DR. C. P. McCORD, Detroit. Mercury poisoning will disappear from the hat industry when some enterprising person finds a successful, practical carrot to substitute for mercuric nitrate. Just as mercury poisoning appears in the hat industry, there must be some twenty other industries in the country in which there are exposures to mercury. The manifestations are not always the same as those presented here. For example, in the cartridge industry every cartridge is likely to have a very small trace of mercury fulminate introduced at the base of the cartridge or the cap of the shell, as a detonator, to set off the powder or the charge. The fulminate as used is ordinarily in a wet state, so that the manifestations that have been described and shown here do not appear. There, instead, practically 100 per cent of workers making these cartridges will show ulcerated finger tips, erosion under the nail and very sore fingers, due to mercury. Just as this excellent study has been made, it is to be hoped other industries throughout the country may be made the recipients of studies as to mercury exposures and the type of cases that arise in these other industries.

DR. HAVEN EMERSON, New York. I want to ask about that astonishingly low positive Wassermann reaction, whether it was explained by the abnormality, perhaps, of the condition of the blood serum of these men or whether it is consistent with a low incidence of syphilis in that part of Connecticut. There is no such low rate reported in any place in the United States except the student body of the University of Minnesota, and an incidence rate of positive Wassermann reactions in adult males of the wage-earning age of 17 per cent calls for some explanation. I would be interested in knowing whether the author has given consideration to this, as I gather that he has not taken a control series of persons not in the hatters' industry out of that same population.

DR. R. R. SAYERS, Washington, D. C. I am interested in other phases of the subject than that which has been discussed by Drs. Neal and Jones. Dr. Brown has probably had the opportunity of seeing the engineering report of the companies covered in this medical report which should be correlated with it. The engineering report was presented before the American Public Health Association. I also hope to make a study in other industries in which there is mercury poisoning. The companies that use mercury or mercury compounds seem to be agreed that they would like a complete study such as is suggested.

DR. E. R. HAYBURN, Columbus, Ohio. While tremor is characteristic of mercury poisoning, it is also seen with other common industrial metallic poisonings such as lead, arsenic and antimony. Gingivitis and the dark line in the gum margin may be present as a consequence of absorption of any metal having a black sulfide, and particularly, therefore, lead, bismuth and mercury. With regard to the Wassermann test I should

like to call attention to the fact that in 1924 Sir Thomas Oliver (Kober and Hayhurst, Industrial Heath, p 427) insisted that a positive Wassermann reaction might be produced by lead poisoning. He says "In the largest percentage of the male and female workers giving a positive reaction syphilis, in my opinion, could be excluded." Evidently the reaction is quite contrary to the experience of the present authors with exposure to mercury. So far as I know, no one has investigated this debatable positive Wassermann reaction in lead poisoning further. Obviously it would be difficult to settle the point when human beings are the experimental "animals."

DR MILLARD KNOWLTON, Hartford, Conn. With reference to the results of the Wassermann test on Connecticut people, for more than 20,000 applicants for marriage licenses under the marriage law the Wassermann reaction was positive in less than 1 per cent. I should like to ask one question about the situation in the hatters' industry. Dr McCord, I believe, suggested that the one way to prevent mercury poisoning is to find some other method of carroting. I have an impression that work has been done along that line, and I am wondering whether we could be given information as to the present status of the matter.

DR D CHESTER BROWN, Danbury, Conn. Dr Knowlton raised the question with regard to the amount of effort that has been made to eliminate mercuric nitrate from the carroting process. There are different methods of obtaining this felting process and with one kind of fur one will be successful and, with another, another will be successful. Mercuric nitrate will take most of the furs that are used as diluents and make them felt fairly well. It is so far the only material that has been found that is successful with the large number of furs used as diluents. There has been discovered a process that has been patented that eliminates mercury entirely from the carroting process. If we can accomplish this, our preventive medicine is established.

DR PAUL A NEAL, Washington, D C. I am sorry I didn't have time to discuss engineering methods of control. Public Health Service engineers studied all the fur cutting factories in operation in this country, and they have given special attention to means for keeping mercury exposure down below toxic limits. In fact, certain fur cutting factories in this country use the measures recommended by the engineers and their mercury exposure is below the toxic limits. A complete report of these engineering observations and of their relation to the medical observations which I have just discussed will appear in Public Health Service Bulletin 234. I don't know whether mercury exposure has anything to do with lowering the syphilis rate or not. There was a rather unusual mixture of races and nationalities in the group we examined and we couldn't find any objective way to decide whether the low syphilis rate was due to mercury exposure or to some other factor. We couldn't find a comparable group of people with the same racial origins, same socioeconomic status, and so on, who had not been exposed to mercury in either the fur cutting or the hatting industries. We were not trying to find out how to treat individual cases of mercurialism, we were trying to find out how to prevent fur cutters from contracting mercurialism. I should like to make the point that we studied only the fur cutting industry since it was the fur cutting industry that requested the study. Up to the time of this study the hatting industry had not agreed to a study of this kind but it may be possible, in the near future, as Dr Sayers mentioned, to make an engineering and medical study of the hatting industry. Like every one else, of course we are interested in reports that a nontoxic substitute for mercury in the carroting process has been found. We looked for allergic reactions to fur dust and mercury but we didn't find any. Perhaps any one who was allergic to these conditions left the industry.

THE LEUKOCYTE RESPONSE TO SULFANILAMIDE THERAPY

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Sulfanilamide is now being very widely used by the medical profession. It has become so popular that it is being prescribed over the counter by druggists. So far very little is known of its mode of action or of its effects on the body tissues. Certain toxic or deleterious actions have been recognized as occurring, namely, nausea, vomiting, dizziness, hyperpyrexia and cyanosis. There is also an undercurrent of feeling that there might possibly occur a depression of the blood cells such as has occurred with other drugs, notably aminopyrine. The literature contains the reports by three authors¹ of four cases of leukopenia, and another author² reports three cases of a hemolytic type of anemia and mentions three other similar cases, all occurring during the administration of sulfanilamide. Borst³ reports a case in which fatal agranulocytosis (white cells 960 with 87 per cent lymphocytes) occurred during sulfanilamide therapy. Unfortunately, bone marrow studies were not made at autopsy, nor were blood cultures taken. There was a history of bleeding and petechial hemorrhages some years previously, which raises the question of whether the agranulocytosis was the result of the infection or of the therapy. A case of fatal agranulocytosis is reported by Young⁴. Sulfanilamide was administered for eighteen days. At the beginning of therapy the leukocytes numbered 12,000, of which 4,344 were lymphocytes. There was a gradual reduction of the leukocytes to 7,800, of which 1,755 were lymphocytes, on the day before the drug was stopped. Five days later, the day before death, there were only 1,800 leukocytes, all of which were lymphocytes. The diagnosis at necropsy was that death was due to agranulocytic angina with hemolytic *Staphylococcus aureus* and *Streptococcus viridans* septicemia.

To determine the leukocyte response to sulfanilamide therapy we made daily leukocyte counts before, during and after administration of the drug. Schilling counts were also made in an effort to determine the immunity response, the lymphocyte-polymorphonuclear ratio and the appearance of early cell forms. These counts were always made at approximately the same hour of the day. Daily hemoglobin determinations and red cell and platelet counts were not made. Thirty-three patients, some without infection and some with various types of infections, were carefully studied. Nose and throat cultures as well as cultures of infected areas were made frequently, blood cultures were also made when indicated.

In the accompanying table the results of the blood study and appropriate clinical notes are given on a

The sulfanilamide used in this work was furnished by the Abbott Laboratories from the Otho S. A. Sprague Memorial Institute and the Children's Memorial Hospital.

1. Mossell, B. F. Studies on the Use of Proflavin in Rheumatic Fever. *New England J. Med.* **216**: 487 (March 18) 1937. Plumer, H. E. Case Report. *Ibid.* **216**: 711 (April 22) 1937. Trumper, Abraham. Case Report. *Ibid.* **216**: 857 (May 13) 1937.
2. Harvey, A. M. and Janeway, C. A. The Development of Acute Hemolytic Anemia During the Administration of Sulfanilamide. *J. A. M. A.* **109**: 12 (July 3) 1937.
3. Borst, J. G. G. Death from Agranulocytosis After Treatment with Proflavin. *Lancet* **1**: 1519 (June 26) 1937.
4. Young, C. J. Agranulocytosis and Para-Amino-Benzene Sulfanilamide. *Brit. M. J.* **2**: 105 (July 17) 1937.

The Basis of Preventive Mental Hygiene—The schizoid child is not a normal child and the very traits which set him apart as an example of goodness and meekness are the identical ones which are responsible for the dementia praecox symptomatology. It is the recognition of this very important basic principle upon which rests all hope of preventive mental hygiene—Milici, Pompo. *Dementia Praecox Preventable*. *Psychiatric Quart.* **11**: 552 (Oct.) 1937.

Results of Blood Studies and Clinical Notes

Case	Diagnosis	Date	Cultures Hemo- lytic Streptococcus	Sulfanilamide Daily Dose	Hemoglobin per Cent (Sahli)	Leukocytes per Cubic Millimeter	Schilling Count per Cent										Cyanosis	Comment		
							Basophils	Eosinophils	Neutrophils				Lymphocytes							
									Mature	Juveniles	Stab	Segmented	Total	Mature	Blasts	Total			Monocytes	
1	Bilateral suppurative otitis media bron- chopneumonia strep- tococci dermatitis high fever 8 days, ears opened 5/1 age 1 year	5/ 3	Throat +	15 gr	68	23 800						33	54	87	13			Temperature 103 Temperature 100 Temperature normal rest of time		
		5/ 4	Same	15 gr		32 400						16	57	73	23					
		5/ 5	Same	15 gr		6 750		1				11	50	51	20	1	21			
		5/ 6	Same			7 525							19	29	48	47		47	5	
		5/ 7	Same			11 200		1	2				17	33	50	32	3	35	12	
		5/ 8	Same			8 900			1				9	36	40	47		47	7	
		5/ 9				13 000							18	27	45	43	2	40	9	
		5/10	Negative			8 075							20	25	48	45		40	7	
5/17				72	9 600						12	24	36	52		52	12	Ears dry child well Child well		
2	Bilateral otitis media left mastoid tender- ness and swelling fever for 5 days age 5 years	5/ 6			80									90	6		6	4	Temperature 102 4 Temperature 104 4 left ear opened Temperature 106 6 Temperature normal hereafter	
		5/ 7		20 gr		40 100					5	30	52	87	8		8	5		
		5/ 8	Throat +	25 gr		15 200							32	60	92	6		6		2
		5/ 9		20 gr		10 200					2	20	35	57	23		28	15	Right ear normal and mastoid normal	
		5/10	Same	20 gr		5 075		1		2	18	35	50	30	2	32	14			
		5/11	Same	20 gr		7 800						29	33	62	26	2	28	10		
		5/12	Negative	20 gr		7 400						19	39	58	22		22	19		
		5/13	Negative			8 400	1	1				20	39	64	24		24	10	Slight discharge from left ear 5/22 ear dry	
		5/14				7 150		2				14	42	56	31	2	33	11		
3	Age 11 years left acute otitis media and mastoid tender- ness high fever for 4 days	5/ 4	Throat +			10 550						37	49	80	9		9	5	Temperature 104 left ear opened Temperature 102 Temperature normal hereafter	
		5/ 5	Same	55 gr		14 100				1	23	60	84	12		12	4			
		5/ 6	Same	70 gr		7 200		2				18	51	69	20		20	0		
		5/ 7	Same	60 gr	90	8 500							14	56	70	20	1	21	9	Mastoid normal Ear dry child well
		5/ 8	Same	30 gr		9 800		1				22	41	63	33		33	3		
		5/ 9	Same	30 gr		10 000		1		1		19	45	65	28		28	6		
		5/10	Same	20 gr		6 975						15	48	63	30		30	7		
		5/13			100	13 100						6	49	55	43		43	2		
		5/15			100	9 900		4				5	62	67	25		25	4		
		5/24				12 800						12	64	75	20		20	4		
4	Age 18 months bilateral suppurative otitis media cervical adenitis high fever 2 weeks	5/ 2	Throat and ears +		74	39 400								78	13		13	9	Temperature 106 blood culture negative Temperature 100 Temperature 101 Temperature normal hereafter	
		5/17			72	19 800							23	56	79	18		18		3
		5/18		15 gr	70	20 200							14	34	48	42	1	43		7
		5/19		15 gr	72	7 075		2												Ears dry Fever recurred and ears drainage again 5/20
		5/20			72	10 300		1		1	15	48	64	30	2	32	4			
		5/21	Same		70	18 150			3		21	55	79	13		13	7			
		5/24			70	10 900		4			17	35	52	39		39	5			
5	Age 7 years left sup- purative otitis media with mastoid tender- ness ear opened 4/20 fever for 9 days readmitted 5/4 with fever left suppu- rative otitis media and mastoid tenderness mastoidectomy 5/7	4/24	Left ear +		60	21 600		2				23	47	70	33		23	5	Temperature 101 4 Temperature 100 6 Temperature 101 Temperature normal hereafter and no mas- toid tenderness	
		4/25				20 700		2				24	56	80	12		12	5		
		4/26		30 gr		20 000			1			26	50	77	16		16	5		
		4/27	Negative	20 gr		13 320		2				5	40	65	40		40	5	Home ear dry Temperature 102 mas- toid pain Temperature 104 mas- toid pain Temperature normal hereafter	
		4/28		30 gr		8 800						5	65	60	30		30	10		
		4/29		30 gr		10 900						8	57	63	27		27	8		
		4/30				10 800						12	56	68	30		30	2		
		5/ 1				9 420						10	49	60	32		32	6		
		5/ 4		40 gr		20 400						17	63	80	16		16	4		
		5/ 5		40 gr		10 000						8	63	71	18		18	10		
		5/ 6	Left ear +	40 gr		6 800						9	60	69	18		18	13	On 6/10 ear and mastoid dry	
		5/ 8				7 800				1	14	52	67	20		20	3			
		5/ 9				15 000						10	56	68	29		29	3		
5/10				10 300		2				7	53	60	25		25	10				
6	Age 9 years pneu- monia 5 weeks ago daily chill and high fever for 5 days	6/ 2			90	10 300		1						63	28		23	2	Temperature 101 2 Temperature 100 Temperature 106 Temperature 100 4 Temperature 100 4 and chill Temperature normal hereafter	
		6/ 4	Blood cul- ture negative		88	21 600								83	16		16	1		
		6/ 6	Same	Prontosil 20 cc										76	16		16	6		
		6/ 7		Prontosil 15 cc		16 700	1	1						71	28		23	1	Child well	
		6/ 8		40 gr		12 000								67	20		20	4		
		6/ 9		40 gr		10 200	2	2						62	32		32	5		
		6/10		40 gr		19 600		1						64	31		31	4		
		6/11		40 gr		10 700								57	36		37	6		
		6/12		40 gr	86	12 700		1						59	37		37	4		
		6/13		40 gr		9 100								50	35		35	3		
6/14		30 gr		7 600		1						43	32		32					
6/15				9 700																
7	Age 1 year infected laceration of eyelid with erysipelas of face and fever for 4 days	4/17	Wound +		62	19 200								44			44	12	Temperature 101 101 to 4/24 Temperature 101 Temperature normal hereafter	
		4/23		20 gr		20 600							16	67	82	14		14		3
		4/24		20 gr		16 700				1		21	45	67	30		33			
		4/25		20 gr		14 200		3				18	20	53	40		40	4	Infection much better later	
		4/26		20 gr		12 600			1			11	25	42	40	3	44	10		
		4/27		20 gr		8 700		2				16	17	33	30	2	57	9		
		4/28				11 000		1				10	20	49	40		40	5		
		4/29				12 000						14	30	50	42		42	8		
		4/30	Throat +			10 000						20	45	60	50		50	2		
		5/ 1	Same			10 000														

Case	Diagnosis	Date	Cultures Hemo-lytic Streptococcus	Sulfanilamide Daily Dose	Hemoglobin per Cent (Sahli)	Leukocytes per Cubic Millimeter	Seibling Count per Cent										Comment	
							Neutrophils					Lymphocytes						
							Basophils	Eosinophils	Mature	Juvenile	Segmented	Total	Mature	Binests	Total	Monocytes		Cyanosis
12	Age 9 years hemolytic streptococcus peritonsillitis abdominal pain and fever for 7 days critically chilled	5/17	Peritonsillar pus +	Prontosil 10 cc	90	82 600												Temperature 104.8 ab domen opened and drained
		5/18		Prontosil 10 cc	90	37 150												Temperature varied daily from 105 to 101 during this study
		5/19	Throat +	50 gr	92	32 500												
		5/20		45 gr	90	24 770												
		5/21			96	18 100												
		5/22			100	17 500												
		5/24			100	24 900												
		5/29		60 gr	98	28 000												
		5/30		30 gr	60													Hemorrhage from wound given trans fusion
		6/1			60	23 600												
		6/5			60	20 000												Pelvic abscess forming
13	Age 8 years hemolytic streptococcus infection of right hip with septicaemia pneumonia and jaundice high fever and occasional chill for 2 weeks	4/2	Blood +		92	21 300												
		4/5	Throat —		88	18 600												
		4/6				10 800												
		4/7				18 500												
		4/8				30 000												
		4/9		40 gr		24 700												
		4/10	Blood +	45 gr		20 000												
		4/11	Throat +	40 gr	72	17 100												
		4/13		through 4/13		12 400												
		4/16																
		4/23		45 gr from		32 600												
		4/24				23 300												
		4/26		4/22 to		17 200												
		4/27		5/3		12 900												
		5/3				16 920												
21	Age 43 years hemolytic streptococcus carrier throat infection 4 days previously well now	5/3	Throat +			11 500												
		5/4	Same			8 275												
		5/5	Same	60 gr		12 000												
		5/6	Same			6 200												
		5/7	Negative			9 200												
		5/8	Negative			12 000												
		5/10	Throat +			11 100												
22	Age 26 years hemolytic streptococcus carrier throat infection subsided 5 days ago	4/12	Throat +		91	12 700												
		4/13	Same			11 300												
		4/14	Same	40 gr 4/15		12 400												
		4/16	Negative	45 gr		7 900												
		4/17	Negative	45 gr		9 600		</										

representative group of patients. We adhered fairly closely to a dosage of 15 grains (1 Gm) to 20 pounds (9 Kg) of body weight irrespective of age. The sulfanilamide was always given by mouth.

I RESPONSE WHEN A LEUKOCYTOSIS WAS PRESENT

Twenty-seven of the thirty-three patients had an increase in the white cell count prior to the administration of sulfanilamide.

A Infection with Fever—Seventeen of the twenty-seven patients had an infection with fever at the time medication was started.

1 In seven of these children (cases 1, 2, 3, 4 and 5 in the table) the total white cell count dropped to normal in a crisis-like manner within twenty-four hours after the fever had subsided. This occurred after from one to four days of medication. In case 1 the white cell count decreased from 32,450 to 6,750 within twenty-four hours after the temperature became normal. As a rule, the white cell count would remain at a normal level while sulfanilamide was being given, but when it was discontinued the total count would increase moderately for a few days and then return to a normal level. If there was a recurrence of the infection, as happened in cases 4 and 5, the leukocyte count would increase and when medication was again started the same sudden drop to normal occurred with subsidence of the fever.

CASE 6—A child, aged 12 years, weighing 77 pounds (35 Kg), had spreading erysipelas of the head with a temperature of from 104 to 105 F for six days. The leukocyte count was 10,850. By the Schilling differential count there were 92 per cent polymorphonuclear leukocytes, of which 52 per cent were immature neutrophils. The hemoglobin was 90 per cent (Sahli). Sulfanilamide 40 grains (2.6 Gm) was administered daily for five days with 5 cc of disodium salt of 4-sulfamidophenyl-2-azo 7'-acetyl amino-1'-hydroxynaphthalene-3',6' disulfonic acid (prontosil) also given on each of the first three days. On the third day of medication the erysipelas stopped spreading and there was a rapid recession of the infection. During the first four days of therapy the temperature ranged from 102 to 105 F and the leukocyte count was between 11,700 and 13,350. The Schilling count showed a steady decrease in polymorphonuclear neutrophils to 76 per cent and a relative increase in lymphocytes and monocytes. On the fifth day of therapy the temperature became normal and remained so. The white cell count was 8,300 with 67 per cent polymorphonuclear leukocytes and a definite decrease in the stab forms. On this day cyanosis developed and lasted four days. The hemoglobin was 92 per cent (Sahli) when the cyanosis appeared.

CASE 7—A child, aged 5 years, weighing 30 pounds (13.6 Kg), after scarlet fever had chronic left suppurative otitis media and a left subperiosteal mastoid abscess. The left mastoid had been operated on three months before. The mastoid pain and swelling and temperature were present for two days. The leukocytes totaled 23,600 with an 80 per cent polymorphonuclear preponderance. Sulfanilamide 20 grains (1.3 Gm) was administered daily for seven days. The mastoid abscess was opened on the first day of therapy and the temperature became normal on the fourth day. The leukocyte count decreased gradually from 23,600 to 12,000 on the fourth day, and then to 6,200 and 7,000 on the fifth and sixth days respectively. The Schilling count showed a gradual shift to the right, the neutrophils dropping from 80 to 46 per cent. The mastoid wound was healed on the fifth day but the ear continued to discharge. Cultures from the mastoid and ear yielded *Staphylococcus aureus*.

2 In four children (cases 8 and 9 in the table) the leukocyte count dropped to normal in a manner simulating lysis in from three to five days after the temperature became normal. In three of the four

children a moderate increase in leukocytes occurred after the period of medication.

CASE 10—A child, aged 8 years, weighing 49 pounds (22 Kg), had acute right suppurative otitis media with fever for three weeks and mastoid tenderness for one week. The leukocyte count varied between 16,600 and 19,300 with from 73 to 84 per cent polymorphonuclears, of which 68 per cent were mature. Sulfanilamide, 30 grains (2 Gm), was given daily for seven days. The temperature became normal after the second day. The leukocytes decreased gradually from 16,650 to 9,075 during the next three days and remained at the latter level until therapy was discontinued, after which they increased to 10,250. The Schilling differential was characteristic of healing infection, i.e., decreasing polymorphonuclears to 63 per cent with a relatively high monocyte count of 15 per cent. The mastoid tenderness disappeared in twenty-four hours and the ear stopped draining eight days after medication was started. Cultures of the throat and ear were persistently positive for hemolytic streptococci.

CASE 11—A child, age 11 years, weighing 54 pounds (24.5 Kg), had recurrent acute mastoiditis. There was pain in the ear for four weeks and pain and swelling over the mastoid with a temperature of over 101 daily for eighteen days. The leukocyte count was from 12,000 to 15,360. The Schilling count was characteristic of an acute otitis media and mastoiditis, i.e., polymorphonuclear leukocytosis of 90 per cent with 30 per cent stab forms. A mastoidectomy was performed two days before sulfanilamide therapy of 40 grains daily for ten days. The temperature became normal and remained so twenty-four hours after therapy was started. There was a dry ear in five days and the mastoid was healed in ten days. The leukocyte count decreased from 12,900 to 9,000 in seven days after the temperature became normal. The granulocytes decreased to 54 per cent but showed no toxic changes. The differential count was interpreted as reflecting a healing infection. Hemolytic streptococci were obtained from cultures of the mastoid and ear only.

3 Cases 12 and 13 in the table are representative of six children with severe or critical infections. Sulfanilamide was given but was discontinued some days before the temperature became normal. In this group there were minor fluctuations in the total leukocytes but in every case the white cell count remained elevated, commensurate with what one would expect during an infection, and did not become any lower during the periods of therapy than when the drug was not being given.

CASE 14—An infant, aged 6 months, weighing 20 pounds (9 Kg), had meningococcal meningitis. Fever was present for two weeks before admission. After admission 40,000 units of meningococcus antitoxin was given on three occasions. The white cell count was from 20,300 to 35,200 for five days before prontosil therapy. The differential count showed an 89 per cent polymorphonuclear preponderance with 70 per cent mature forms. Prontosil 10 cc was given daily for five days, then sulfanilamide 15 grains for one day. The leukocyte count fluctuated between 40,850 and 18,400 during this period, and there was some clinical improvement but continuous fever. Twenty-four hours after therapy was discontinued the temperature became normal and the leukocyte count dropped to 14,900. The Schilling count showed a shift to the left immediately after the drug was started, but then there was a decided decrease in the polymorphonuclears (from 90 to 55 per cent) which paralleled the drop in white cells and the clinical improvement.

CASE 15—A child, aged 5 years, had a subperiosteal abscess of the mastoid and erysipelas of the face. Fever was present for seven days with earache on the left and swelling over the mastoid. The leukocyte counts were from 12,700 to 137,000. Hemoglobin was 75 per cent (Sahli). Sulfanilamide was given 30 grains daily for five days and then 15 grains daily for two days. The leukocyte count fluctuated between 9,550 and 184,000 during this therapy. The Schilling count was characterized by a sustained polymorphonuclear preponderance of from 74 to 87 per cent with from 40 to 63 per cent stab cells. This differential is what one would expect in an acute otitis media or mastoiditis. Hemoglobin was 90 per cent (Sahli) during

therapy, but no cyanosis developed. The erysipelas improved rapidly but the temperature did not reach normal until two days after therapy was discontinued. The mastoid discharged for one week longer. Cultures from the mastoid yielded hemolytic streptococci.

CASE 16—A child, aged 7 years, weighing 45 pounds (20 Kg), had erysipelas of the left leg and an abscess of the left foot. There was high fever, pain and swelling of the left leg and foot for seven days. The leukocyte counts were from 16,000 to 20,100. Prontosil, 2.5 cc, was given for one day and 12.5 cc daily for two days. The leukocyte counts were from 17,500 to 20,400. In the Schilling count there was a decided shift to the left with from 30 to 43 per cent stab forms. The total neutrophils remained fairly constant around 80 per cent. After therapy was discontinued the temperature remained elevated owing to an abscess formation of the left foot. The erysipelas cleared up but the abscess had to be incised. Cultures from the area of erysipelas and from the abscess of the foot yielded hemolytic streptococci.

CASE 17—A child, aged 9 years, weighing 72 pounds (33 Kg), had chronic bilateral otitis media (*Bacillus pyocyaneus*) and chronic suppurative right hip disease (hemolytic streptococci). Leukocyte counts varied between 16,500 and 20,700 with 80 per cent polymorphonuclear cells, of which 30 per cent were immature forms. Sulfanilamide 30 grains was given daily for seven days. Leukocyte counts fluctuated between 16,500 and 30,000. At the time that the leukocyte count was going up a new abscess of the hip was forming. The Schilling count again was that of an acute infection with polymorphonuclear preponderance of 80 per cent but only a slight increase of immature forms. Therapy had no effect on the ears or the hip disease.

B Infections Without Fever—There were only three cases in this group.

1 In two of the children the leukocytes decreased to normal almost simultaneously with clinical improvement.

CASE 18—A child, aged 5 years, weighing 38 pounds (17 Kg), had had bilateral suppurative otitis media for one month. Leukocyte counts were between 10,175 and 13,050. The Schilling count revealed only from 48 to 60 per cent polymorphonuclear leukocytes and only from 12 to 15 per cent stab cells. The monocyte count was 14. Sulfanilamide 25 grains (1.6 Gm) was given daily for four days. The ears became dry three days after therapy was started. The leukocyte count dropped to 8,150. No therapy was used for five days and the leukocyte count increased to 10,300. Sulfanilamide 25 grains was again given for three days and the leukocytes dropped to 6,150, only to rise to 9,850 after therapy was discontinued. The Schilling count showed an absolute as well as a relative decrease in the granulocytes, most marked on the last day of therapy (36 per cent with 8 per cent stab forms). Cultures from the ears and from the throat yielded hemolytic streptococci.

CASE 19—A child, aged 2 years, weighing 28 pounds (13 Kg), had had a suppurative otitis media for one week. The clinical course, sulfanilamide therapy and the blood picture exactly followed that of case 18, except that the ears began to discharge again after sulfanilamide was discontinued the first time. With resumption of treatment the ears again became dry and so remained. Cultures from the ears and from the throat yielded hemolytic streptococci.

2 In a case in which there was infection without fever the leukocyte count gradually decreased to normal.

CASE 20—A child, aged 6 years, had acute suppurative left otitis media with mastoid abscess. Symptoms and fever were present for one week. The mastoid abscess ruptured spontaneously and the temperature became normal five days later. Leukocyte counts were between 21,800 and 14,800 during this period. There was profuse drainage from the ear and mastoid for five days, when 30 grains (2 Gm) of sulfanilamide was given daily for five days. The ear and mastoid were healed three days after therapy started and the leukocytes decreased from 21,650 to 9,800 three days later. The relative Schilling count did not shift appreciably during this time. Cultures from the ear, mastoid, nose and throat yielded hemolytic streptococci.

C No Evident Infection—There were seven cases in this group.

1 In four (cases 21 and 22 in the table) the white count decreased to a normal level within twenty-four hours after sulfanilamide therapy was started. In all these patients there had been a recent recovery from an infection of the throat. The drug was administered because of persistently positive hemolytic streptococcus throat cultures.

CASE 23—A nurse, aged 21 years, weighing 94 pounds (42.6 Kg), had a throat infection five days previously. The leukocyte count for three days after recovery was between 14,050 and 12,200. The Schilling count was as follows: neutrophils 83 per cent with 3 per cent myelocytes, 5 per cent juveniles and 27 per cent stab cells. There were 3 per cent eosinophils, 13 per cent lymphocytes and 1 per cent mononuclears. Sulfanilamide 40 grains (2.6 Gm) was given daily for three days. Leukocyte counts varied between 11,500 and 13,050. The Schilling count showed a 20 per cent drop in neutrophils and a marked increase, to 15 per cent, of mononuclears. Twenty-four hours after medication was stopped the white count decreased to 9,700. Throat cultures were positive for hemolytic streptococci before therapy and negative during therapy but became positive again several days after therapy was discontinued.

CASE 24—A nurse, aged 22 years, weighing 140 pounds (63.5 Kg), had had no recent infection but had been off duty because of a persistently positive hemolytic streptococcus throat culture. The leukocyte count for three days varied from 12,500 to 11,050. There was a moderate polymorphonuclear leukocytosis with a 10 to 15 per cent monocyte count. Sulfanilamide 60 grains (4 Gm) was given daily for three days. The leukocyte count during this time decreased from 11,050 to 8,275. The Schilling count remained the same. After therapy the leukocytes remained at about 9,000. The throat culture remained positive.

2 In two children without clinical evidence of recent infections the white cell count decreased to normal over a period of several days.

CASE 25—A child, aged 7 years, weighing 39 pounds (17.7 Kg), had a leukocyte count for three days of from 9,500 to 14,200. The Schilling count showed a lymphocytosis of from 50 to 60 per cent. Sulfanilamide 30 grains was given daily for three days and then stopped because a cyanosis developed which lasted for three days. The leukocyte count decreased from 10,150 to 7,100 and remained at that level, and there was a marked stimulation of monocytes to 35 per cent. Nose and throat cultures were negative for hemolytic streptococci. The hemoglobin was 95 per cent (Sahli) on the last day of cyanosis.

CASE 26—A child, aged 6 years, weighing 45 pounds (20.4 Kg), had a leukocyte count for three days of between 16,600 and 18,400. The Schilling count was not unusual in any respect. Sulfanilamide 30 grains was given daily for three days and then discontinued because of cyanosis, which lasted for three days. The leukocyte count decreased from 18,400 to 11,950 and two days after therapy was stopped was 8,500. The Schilling count shifted to an equal polymorphonuclear-monocyte response with 12 per cent monocytes. The hemoglobin was 120 per cent (Sahli) the day before cyanosis and from 100 to 104 per cent during the period of cyanosis. Cultures of the throat were persistently positive for hemolytic streptococci.

3 In one case there was no change in the white count due to therapy.

CASE 27—A child, aged 6 years, weighing 44 pounds (20 Kg), had suppurative otitis media for three months following scarlet fever. The ear had practically stopped draining five days before therapy was started. Leukocyte counts were between 10,050 and 9,725. The Schilling count was that of chronic infection, i.e., slight preponderance of polymorphonuclears with from 10 to 12 per cent monocytes. Sulfanilamide 30 grains was given daily for five days. The leukocyte count was from 9,725 to 8,800, at which level it remained after therapy. The Schilling count was not influenced by the drug. Throat cultures were positive for hemolytic streptococci until the fourth day of therapy, after which they remained negative.

II RESPONSE WHEN NORMAL LEUKOCYTE COUNT WAS PRESENT

Six patients with and without infections had a normal leukocyte count at the time sulfanilamide was given

A Infection with Fever—1 The leukocyte count was unchanged

CASE 28—A child, aged 9 years, weighing 83 pounds (37.6 Kg), was sick for one week with fever due to a throat infection and stomatitis. The leukocyte count was 6,700. The Schilling count revealed polymorphonuclears 78 per cent with 13 per cent stab cells, 19 per cent lymphocytes and 3 per cent mononuclears. Sulfanilamide 40 grains was given daily for two days. The leukocyte count remained at 9,800 for two days and then was 7,550. The only change in the Schilling count was absolute rather than relative because of a change in the total number of leukocytes. On the second day of medication continuous vomiting occurred, and the child developed a marked acidosis with a carbon dioxide combining power of 30 volumes per cent. The hemoglobin was from 128 to 138 per cent (Sahli) during the period of cyanosis, which lasted three days. There was still evidence of the stomatitis ten days after the temperature became normal. Smears were positive for spirilla and fusiform bacilli. The drug had no effect on this infection. Undoubtedly it did produce the vomiting and acidosis and the cyanosis.

B Infection Without Fever—There were three cases in this group

1 In two children with chronic infections a leukopenia developed during administration of the drug (cases 29 and 30 in the table). The polymorphonuclear leukocytes were never reduced below 45 per cent, so that the granulopenia was relatively slight.

2 There was no change in leukocytes due to medication (case 31 in the table).

C No Infection Present—There were two patients (cases 32 and 33 in the table) in whom therapy did not affect the white cell count.

COMMENT

In thirteen patients with a leukocytosis the white cell count dropped to normal within from twenty-four to thirty-six hours after clinical improvement, while in six children the white cell count decreased to normal only forty-eight hours or more after clinical improvement. In one the leukocytosis showed no change. In six children with long drawn out infections the leukocyte count was not lowered during the course of the infection, but observation was not carried out long enough to ascertain the leukocyte response at the end of the infection. In none of these children did a leukopenia develop.

Of six patients with a normal leukocyte count to whom the drug was given a moderate leukopenia developed in two but did not persist. In the others there was no change in the leukocyte count.

In no instance did we feel that the administration of sulfanilamide caused an increase in the leukocyte count. In only three instances did the count increase during administration of the drug, and it seemed as if this was due to the infection rather than to any other factor. It does seem to us that the drug causes a depression of leukocytes, not only because of the two instances of leukopenia but because of the spectacularly rapid fall in the leukocytes at the end of an infection, which is often followed by a moderate increase in leukocytes after the drug is discontinued. There is also the fact that in six of seven children without infections the leukocytes, which had been increased, rapidly decreased to a normal level. In other words, in only one patient, aged 21, with a

leukocytosis did the count fail to drop after administration of the drug. If the drug had been given over a longer period of time it is possible that a further depression of the total white cells might have occurred. Without sulfanilamide therapy it has not been our experience to have the leukocyte count return to normal with the rapidity encountered during this study.

The alteration in leukocyte response has been in the nature of a marked absolute reduction of all the cell elements without any characteristic relative change. The granulocytes have not been reduced out of proportion to the other cells, and at no time during the administration of sulfanilamide could we demonstrate toxic changes that had not been present previously as a result of the infection alone. In the majority of cases the Schilling differential count reflected what one could consider a healing infection.

Red Cells—Although daily red cell counts were not done, in no instance did we observe a severe anemia. The reduction in red cells was never more than that which could be expected during the course of the infection. If no infection was present, no reduction in red cells took place.

Platelets—Sufficient platelet counts were not done to justify the drawing of definite conclusions, but in the few instances in which they were done no change occurred.

Hemoglobin—The Sahli method of hemoglobin determination was used (standard of 14.5 Gm per hundred cubic centimeters). There was little fall in the hemoglobin content of the blood—in fact, not as much as would be expected during the course of the infection. It was not unusual to find an apparent increased hemoglobin during administration of the drug. Cyanosis developed in seven of the patients (two of them without infections) but it never lasted for more than three to four days. In every instance the hemoglobin was from 90 per cent to over 100 per cent before the cyanosis developed and reached color levels as high as 138 per cent during the period of cyanosis, after which it would rapidly decrease. A moderate dyspnea seemed to be present in one child. An oxygen tent did not relieve the cyanosis in this one instance in which it was tried. In none of the blood specimens taken during cyanosis could we demonstrate a sulfhemoglobin or methemoglobin band with a hand spectroscope. When an apparent high hemoglobin percentage was present (Sahli), with or without cyanosis, the blood always had a dark color, even being brownish. It seems that the drug does produce some changes in the existing blood pigments or in the cell chemistry, or an additional blood pigment is formed in a large number of patients.

Several patients in whom a cyanosis developed during sulfanilamide therapy were again given the drug in the same dosage as soon as the cyanosis disappeared (a period of from three to four days). In none of these children did the cyanosis recur and so far, even in cases not included in the study, we have seldom observed a recurrence of the cyanosis.

Urine—No abnormal urinary changes were found. In two instances in which an acute nephritis was present with the infection the drug was administered without any ill effects.

Response of Infection—Since we were primarily interested in the leukocyte response, very little attention was given to the selection of the infections to be

treated. We were particularly impressed with the almost spectacular response of hemolytic streptococcus infections, especially erysipelas and those involving the ears and mastoids. The more severe generalized streptococcal infections did not respond as readily as those just mentioned, but there is no doubt in our minds that clinical improvement was aided or possibly would not have occurred without sulfanilamide therapy. In several instances *Streptococcus haemolyticus* carriers were given the drug and in every case except one the cultures became negative and remained so for several days, only to become positive again after cessation of treatment.⁵

CONCLUSIONS

1 Sulfanilamide seemed to cause a depression of the white blood cells even to a point at which a leukopenia developed.

2 Agranulocytosis or granulopenia did not occur with this depression or leukopenia.

3 The action of sulfanilamide seems to be independent of the leukocytes in that it does not produce an increase in the total leukocytes or in the proportion of the polymorphonuclear cells.

4 Cyanosis occurred in seven cases but spectroscopic examination of blood specimens in these cases did not reveal bands of sulfhemoglobin or methemoglobin.

5 Sulfanilamide is a very effective drug in beta hemolytic streptococcus infections.

6 Frequent blood cell determinations should accompany sulfanilamide therapy.

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CULTURE OF HUMAN MARROW

STUDIES ON THE MODE OF ACTION OF SULFANILAMIDE

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The simple method of culture of human marrow¹ is well adapted for the evaluation of therapeutic agents. It permits determination of their effect on living human cells, of the toxic dose and of the minimum effective therapeutic dose, and accurate control of concentration. Sulfanilamide was chosen as the first drug to be studied because its use is relatively new,² its mode of action is not thoroughly understood,³ and it has been suggested⁴ that its action may be directly on blood cells rather than on bacteria alone. All experiments on which this article is based are with infections with the beta hemolytic streptococcus. This organism was

chosen for study first because sulfanilamide has been shown to be an effective agent in human infections with this organism⁵ and because it is one of the most important agents producing human disease. However, the same general type of experiments could and should be performed with every known organism to determine whether sulfanilamide offers promise of effectiveness in human infections with them.

METHODS

Marrow cultures were made exactly as previously described.¹ Enough medium was mixed in one vaccine vial for from four to six cultures. This was inoculated with the desired amount of a culture of the beta hemolytic streptococcus,⁶ thoroughly mixed and divided equally among four to six vials, half of which contained marrow cells from which the supernatant medium had been removed after centrifugation. This ensured that the same number of streptococci were introduced into all cultures and that the only difference in the cultures containing marrow and the cultures not containing marrow was in the presence of marrow cells. To all but one of these marrow cultures and all but one of these cultures in medium alone enough sulfanilamide, dissolved in balanced salt solution, was added to give the concentration desired.⁷ As a rule, an equivalent amount of balanced salt solution was added to the controls.

Hartley broth was chosen for further control because it contains no serum and is a good medium for growing this organism. The broth we used was prepared as follows:

Weigh out 1,200 Gm of finely ground lean meat in a 6 quart pail and add 2 liters of tap water. Heat over a free flame to 80 C, stirring meanwhile. Add 2 liters of 0.8 per cent solution of anhydrous sodium carbonate. Cool to 45 C. Add 40 cc of Cole and Onslow's pancreatic extract and 40 cc of chloroform. Stir. Place cover on pail and place in the incubator for six hours, stirring frequently (every hour or so). Remove from the incubator and add 320 cc of normal hydrochloric acid and mix well. Place in the autoclave at not more than from 2 to 3 pounds pressure for one hour. Cool to below 45 C and filter through paper until clear. Place the clear medium in 16 ounce bottles, cap tightly and cover the caps with paper, and sterilize in the autoclave at 15 pounds for fifteen minutes. After the bottles have cooled, tighten all caps.

When counts of organisms are reported, they represent the number of colonies per cubic centimeter as determined from blood agar pour plates made from dilutions of the cultures in sterile salt solution. Since the streptococcus is a chain-forming organism, the numbers probably represent numbers of chains rather than numbers of single organisms.

THE EFFECT OF SULFANILAMIDE ON LIVING HUMAN MARROW CELLS

Comparison of cultures of human marrow or blood not infected with streptococci, containing concentrations of sulfanilamide from 1/250 to 1/500,000 with control cultures without sulfanilamide, showed no

5 Since this study was completed we have had two more cases of leukopenia develop during sulfanilamide therapy. In both cases infection fever and a leukocytosis had been present. As the infection subsided the leukocyte count decreased to 5,000 in one and to 5,700 in the other without neutropenia in either case.

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Read before the Pacific Interurban Clinical Club, Sept. 25, 1937, and before the Conference of City and County Health Officers, Nov. 8, 1937.

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4 Long, P. H., and Bliss, Eleanor A. Para-Amino-Benzene Sulfonamide and Its Derivatives. Experimental and Clinical Observations on Their Use in the Treatment of Beta-Hemolytic Streptococcus Infection. Preliminary Report. *J. A. M. A.* 108: 32 (Jan. 2), 1937.

5 Colbrook, Leonard, Kenny, Neave, and members of the honorary staff of Queen Charlotte's Hospital. Treatment with Protosil of Puerperal Infections Due to Haemolytic Streptococci. *Lancet* 1: 1319 (Dec. 5), 1936. Chemotherapy in Streptococcal Infections. editorial. *J. A. M. A.* 108: 48 (Jan. 2), 1937. Treatment of Streptococcal Infections with Sulfanilamide. *ibid.* March 20, p. 976. Long, P. H., and Bliss, Eleanor A. Aminobenzenesulfonamide and Its Derivatives. Clinical Observations on Their Uses in Treatment of Infections Due to Beta-Hemolytic Streptococci. *Arch. Surg.* 34: 351 (Feb.) 1937. Peters, B. A., and Havard, R. V. Chemotherapy of Streptococcal Infections with P-Benzyl amino-Benzene Sulfonamide. *Lancet* 1: 1273 (May 29), 1937.

6 All experiments in this article were with the beta hemolytic streptococcus of strain AB 13.

7 The sulfanilamide was dissolved in balanced salt solution in concentrations such that only from 0.1 to 1 cc. need be added to a culture to give the desired concentration.

whereas the 1 10,000 sulfanilamide tube inoculated with 0.1 cc of this same dilution showed growth. From the laws of chance it is extremely improbable that more than one chain of streptococci was inoculated into this tube, but nonetheless growth occurred. Since this type of experiment was based on only one organism or one chain, and it seemed theoretically possible that thus by chance was a resistant organism, another type of experiment also was performed.

TABLE 1—Effect of Sulfanilamide on Phagocytosis

Sulfanilamide Concentration in Cultures of		Percentage of Neutrophils Containing Streptococci			
Marrow	Streptococci	0*	1-25*	25-50*	Over 50*
0	0	0	23	25	47
0	1 10 000	0	31	28	41
1 10 000	0	0	25	27	48
1 10 000	1 10 000	0	35	23	37

* Streptococci per neutrophil

In this experiment four tubes of agar were melted, poured into the same receptacle and brought to 45 C, blood was added and streptococci were inoculated from a suitable dilution of a broth culture. This was thoroughly mixed and divided equally into four tubes, also at 45 C in the water bath, one of which contained nothing and the others enough sulfanilamide in balanced salt solution to give a final concentration of 1 1,000, 1 10,000 and 1 100,000 respectively. These

the hemolytic streptococcus are highly destructive both to erythrocytes and to leukocytes, and recovery from massive invasion of the blood stream by this organism is very rare. It seemed possible that, if the action of sulfanilamide were the neutralization, destruction or prevention of formation of these toxins, the organism would resemble a harmless saprophyte and be readily vulnerable to the ordinary defense mechanism.

The prevention of any hemolysis in marrow cultures containing living streptococci (figs 2-4), even though these streptococci were present in large numbers for many days, would seem to show conclusively that the formation of toxin was prevented or that toxin was destroyed. Further, in the experiments described in the preceding section it was noted on the blood agar pour plates that there was a zone of hemolysis about each colony but that the size of this zone was larger in the controls than in the plates containing sulfanilamide. To determine this quantitatively, the diameter of the zone of hemolysis from fifty unselected colonies from each blood agar plate was measured at twenty-four hours with a 10 X magnification and millimeter scale. The diameter of the control in one such experiment was 24 mm, of the 1 100,000 sulfanilamide 21 mm, of the 1 10,000 sulfanilamide 19 mm, and of the 1 1,000 sulfanilamide 17 mm. The fact that any zone of hemolysis at all was visible on these plates was probably due to the fact that sulfanilamide could not diffuse and maintain a uniform concentration as it would in a fluid medium. An attempt was made

TABLE 2—Growth Curves in Terms of Colonies per Cubic Centimeter of Culture

Sulfanilamide Concentration	Marrow Culture			Marrow Culture Medium			Hartley Broth		
	0	1 10 000	1 100 000	0	1 10 000	1 100 000	0	1 10 000	1 100 000
0 hours	350	350	350	400	400	400	300	300	00
2 hours	800	800	800	700	700	700	600	600	500
4 hours	6 000	5 000	4 000	1 500	1 500	1 000	8 000*	8 000*	8 000*
5 hours	15 000*	3 000*	3 000*	3 000*	2 500*	1 500*	30 000	30 000	30 000
6 hours	35 000	2 500	2 500	5 000	4 000	2 000	120 000	60 000*	70 000*
8 hours	300 000	400	900	40 000	5 000	4 000	1 500 000	400 000	500 000
10 hours	5 000 000	200	200	200 000*	4 000	20 000	20 000 000*	800 000	1 000 000
12 hours	20 000 000	0	0	800 000	2 000	80 000	50 000 000	1 500 000	2 000 000
14 hours	30 000 000	0	0	3 000 000*	1 500*	300 000	60 000 000	3 000 000	6 000 000
16 hours	35 000 000*	0	0	12 000 000	1 000	400 000†	60 000 000	3 000 000	20 000 000*
20 hours	40 000 000	0	0	8 000 000	0	10 000 000*	100 000 000†	6 000 000	50 000 000
24 hours	100 000 000†	0	0		0	2 000 000†	100 000 000†	6 000 000	100 000 000†

* Interpolated from the logarithmic curve and from other experiments

† More than

were immediately mixed thoroughly and then pour plates were made in the usual way. The numbers of colonies in each of the four plates were the same within the limits of error of the method. For example, in one such experiment the control showed 170, the 1 1,000 showed 182, the 1 10,000 showed 146 and the 1 100,000 showed 167 colonies.

These experiments show conclusively that even a 1 1,000 concentration of sulfanilamide does not kill this strain of beta hemolytic streptococcus.

DOES SULFANILAMIDE DESTROY THE TOXIN OF THESE STREPTOCOCCI?

It is well known that toxin production plays a major part in the disease-producing powers of microorganisms and that the hemolytic streptococcus produces a number of powerful toxins. It may, in fact, produce the disease scarlet fever without invading the body proper at all. Furthermore, it is known that many organisms may invade the human body and even inhabit the blood stream but are ultimately overcome by the resistance of the human body, for example, undulant fever, typhoid, pneumonia and the like. The toxins of

to set up quantitative titers of toxin from this strain of streptococci, but we were unsuccessful in obtaining an active hemotoxin outside the living culture. It is well known that the hemotoxin of the streptococcus is readily oxidized, unstable and difficult to prepare. It would seem that these observations show that a major action of sulfanilamide is the neutralization of the toxins of this organism.

DOES SULFANILAMIDE HAVE A PERMANENT EFFECT ON THE TOXIN-PRODUCING POWER OF THE ORGANISM?

It would seem possible that the drug might permanently alter the toxin-producing ability of a strain of streptococci exposed to it over long periods of time. That this does not occur was conclusively shown by replacing medium containing sulfanilamide in heavily infected marrow cultures with medium containing no sulfanilamide in which case hemolysis and complete destruction of the cells occurred in less than twenty-four hours. This was shown also by hemolysis in subcultures in blood agar or blood broth of strains grown in sulfanilamide for long periods.

DOES SULFANILAMIDE AFFECT PHAGOCYTOSIS?

Long and Bliss¹ suggested that possibly the major action of sulfanilamide might be a stimulation of phagocytosis of the organisms by the leukocytes. It was noted in all our marrow cultures (figs 2-4) that phagocytosis of the streptococci occurred. The most active cells in phagocytosis were the rhabdocytes (staff

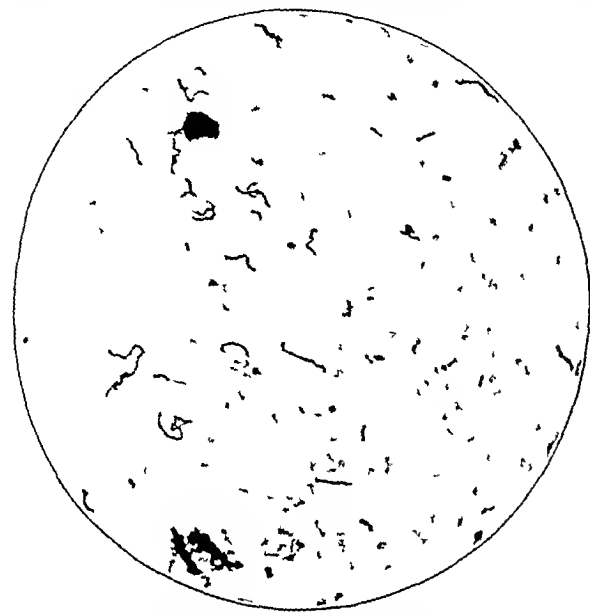


Fig 1—Smear of a four day old marrow culture inoculated with beta hemolytic streptococci and containing no sulfanilamide. Wright's stain $\times 800$. Note the complete destruction of all cells and the large number of organisms. The appearance here illustrated usually develops within twenty-four to forty-eight hours.

cells), but even progranulocytes A (promyelocytes II) so immature they were in the process of mitotic division (fig 4), were capable of phagocytosis. In the cultures containing large numbers of organisms, sulfanilamide and intact marrow cells the number of streptococci which might be taken up by the leukocytes was truly remarkable. Often the entirety of a long chain could be seen, folded back and forth within the leukocytes.

However, the cultures in Hartley broth showed conclusively that sulfanilamide had some action in the absence of leukocytes and sterility of the cultures in medium containing human serum, and no leukocytes showed conclusively that phagocytosis was not solely responsible for the effectiveness of the drug. Furthermore phagocytosis of streptococci was observed in the control cultures which contained no sulfanilamide if they were examined at fifteen to eighteen hours before the leukocytes had been destroyed. These experiments seemed to indicate that sulfanilamide favored continued phagocytosis by permitting the leukocytes that had engulfed bacteria to survive but that phagocytosis was not a major factor in the action of the drug.

To determine definitely the action of sulfanilamide on phagocytosis, a marrow culture was divided into four equal parts, two of which 1:10,000 sulfanilamide was added. At the same time enough sulfanilamide to give a concentration of 1:10,000 was added to a twenty-four hour old culture of streptococci in Hartley broth and another tube of Hartley broth containing no sulfanilamide was inoculated with streptococci. The four vials of marrow and the two cultures were incubated for twenty-four hours. To an equal volume of

each of the marrow cultures was then added an equal volume of a streptococcus culture so that four combinations as shown in table 1 were obtained: one marrow which had not been exposed to sulfanilamide with streptococci which had not been exposed to sulfanilamide; one marrow without sulfanilamide with streptococci which had been exposed to sulfanilamide; one marrow with sulfanilamide with streptococci without sulfanilamide; and one marrow with sulfanilamide with streptococci which had been exposed to sulfanilamide. These were allowed to stand for fifteen minutes and then centrifuged and smears were made and stained with Wright's stain in the usual way. The numbers of streptococci in 100 consecutive neutrophils from each preparation were determined with the results shown in table 1. It is evident from this experiment that very active phagocytosis occurred with all combinations but that sulfanilamide had no direct action favoring phagocytosis on either the marrow cells or the bacteria. In long term experiments, of course, the fact that the toxins of streptococci destroyed the cells and that sulfanilamide prevented this destruction would favor phagocytosis but only indirectly.

It seems justifiable to conclude from these experiments that sulfanilamide has no direct action which favors phagocytosis either on the beta hemolytic streptococcus or on the cells of the marrow.

THE QUANTITATIVE STUDY OF THE ACTION OF SULFANILAMIDE

A series of growth curves of the hemolytic streptococcus in varying concentrations of sulfanilamide in marrow cultures, in cultures in the marrow culture medium and in cultures in Hartley broth were determined. Many such experiments were done before the

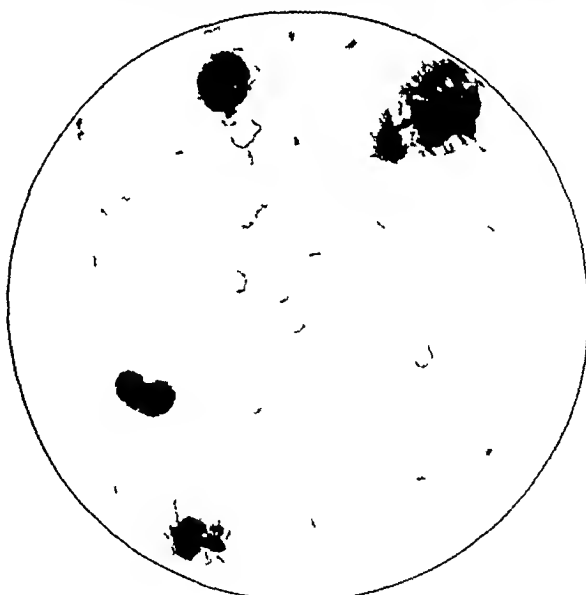


Fig 2—Smear from a four day old culture of the same marrow as figure 1. Wright's stain $\times 800$ inoculated with the same number of organisms but containing 1:100,000 sulfanilamide. Note the large numbers of streptococci and the phagocytosis but that the cells both of the erythrocyte and of the leukocyte series in this marrow are intact.

correct dilutions were found for each interval so that all points on the curve were available in a single experiment. The results of the most successful curves are shown in table 2. In all the other curves the same general type of results were obtained although occasional dilutions were either too low to give a

countable number of colonies on the pour plates or too high to give a statistically significant number of colonies.

These experiments would seem to show conclusively that the rate of multiplication is slowed in all cultures containing sulfanilamide whether in Hartley broth or in marrow, that it requires about four hours for the effects to become discernible, that the rate of division in the controls corresponds to one fission about every thirty minutes and in the cultures containing sulfanilamide about one division every hour, and that in Hartley broth no organisms are killed but that in the medium containing serum or marrow cells, if not inoculated with too large a number of organisms, the number of organisms begins to fall at about six to twelve hours and that these cultures may become sterile. It is further evident that 1:100,000 sulfanilamide is

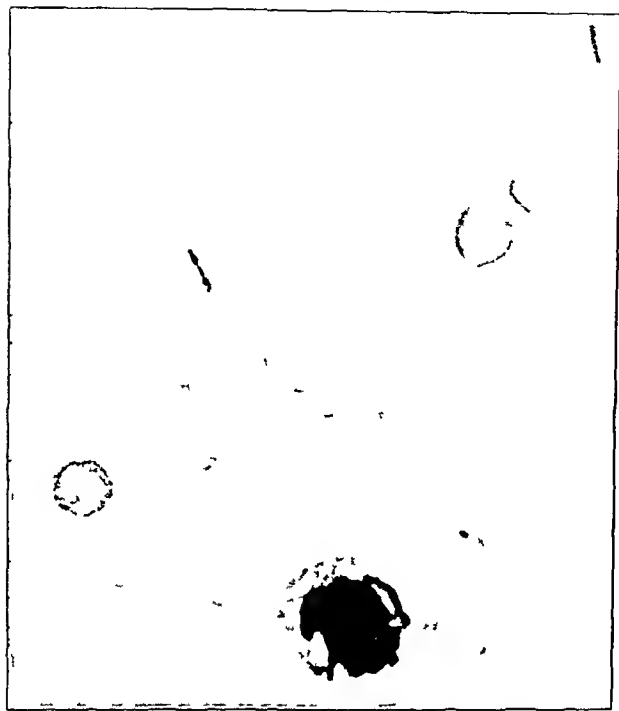


Fig. 3—Smear from an eight day old culture of human marrow inoculated initially with large numbers of streptococci but containing for the entire time a 1:10,000 concentration of sulfanilamide. Wright's stain $\times 1,200$. Note that while streptococci are still present the marrow cells are still intact. This is the same marrow culture inoculated with the same number of organisms as the control marrow in figure 1.

just as effective as 1:10,000 sulfanilamide until the numbers of organisms are greater than occur in human infections and that the presence of the marrow cells results in a somewhat earlier fall and sterility of the cultures than does the presence of serum alone.

Neutralization of the toxins could explain the entire action if the reason for toxin production by microorganisms were to make their environment more suitable for their multiplication. A direct bacteriostatic action of sulfanilamide has not been excluded, however.

It seems justifiable to conclude from these growth curves that sulfanilamide itself does not kill bacteria but that it does after a period of four hours slow their rate of multiplication and render them vulnerable to attack by human serum and cells.

COMMENT

Our experiments seem to indicate that the major action of sulfanilamide on infections with the beta hemolytic streptococcus is to neutralize or destroy the

toxins and to cause a decrease in the rate of division that sulfanilamide itself does not kill the streptococcus but by neutralizing the toxins and decreasing the rate of multiplication does enable the bactericidal action of human serum and the phagocytic action of the neutrophils and monocytes of the marrow and blood to overcome the infection and that sulfanilamide in a concentration of 1:100,000 much less than the 1:10,000 now used clinically, is effective.

If these conclusions are correct they should also explain the clinical and experimental results obtained by other investigators. A number of these results have been very difficult to explain on the basis of any suggestion as to the mode of action of sulfanilamide previously advanced.

The observations of Colebrook, Buttle and O'Meara¹³ are especially interesting. Working with broth, they found that "the addition of 1 in 10,000 of the sulfonamide sufficed to delay the growth of from 30 to 40 cocci for from two to five days." A concentrated solution of 1 in 100 of the sulfonamide in broth did not, however, inhibit growth with an inoculum of 0.1 cm of undiluted culture, containing 300 million organisms, although it inhibited the growth of one tenth of this number of cocci." They also found that when 1:18,000 sulfanilamide was added to human blood containing 3,500 streptococci per cubic centimeter the culture became sterile and that the blood of a monkey, three and a half hours after a single dose of sulfanilamide would sterilize an inoculation of 60,000 streptococci per cubic centimeter. In our opinion this discrepancy between the failure to kill streptococci with a 1:100 sulfanilamide in broth and the killing of the streptococci with a much lower concentration in blood cannot be explained by their conclusions of a bactericidal or bacteriostatic action of sulfanilamide but is readily explained if the action is in destroying toxins and the killing of the organisms is done by the serum and blood cells. They further noted that twenty-four hours after sulfanilamide was administered to monkeys the blood was still capable of overcoming an infection with an inoculation of 6,000 streptococci per cubic centimeter. From the data of Marshall, Emerson and Cutting¹⁴ on excretion it is evident that the blood concentration of sulfanilamide was probably much less than 1:10,000 at this time. Colebrook and his associates¹³ also noticed, in a number of experiments, positive cultures with no hemolysis. In our opinion this could be explained only by the neutralization of the toxins by the sulfanilamide. In table 3 of their article they record that in blood from a patient under treatment with protosil inoculated with streptococci small inoculations were killed while large inoculations multiplied but at a rate slower than the controls. However 1:10,000 sulfanilamide in the bloods of animals such as the rabbit, guinea pig or mouse, which have little natural resistance to the streptococci, even when inoculated with as few as 60 streptococci per cubic centimeter, would not kill them, although growth was inhibited. The results of their other experiments and the experiments of other investigators¹ are also entirely in accord.

13. Colebrook, Leonard, Little, G. A. H. and O'Meara, R. A. Q. The Mode of Action of *p*-Aminobenzenesulfonamide and Its Effect on Hemolytic Streptococcal Infection. *Lancet* 2: 1323 (Dec. 3) 1934.

14. Marshall, J. K., Jr., Emerson, Kendall, Jr. and Cutting, W. C. *p*-Aminobenzenesulfonamide—Metabolism and Excretion. *Metabolism and Excretion in Urine and Blood*. *J. A. M. A.* 104: 923 (March 1935).

15. Buttle, C. A. H., Gray, W. H. and Stephen, Dora. The Effect of Mice Against Streptococcal and Other Infections by *p*-Aminobenzenesulfonamide and Related Substances. *Lancet* 1: 1247 (June 1) 1934.

16. Mellon, R. R., Cross, Paul and Cooper, F. L. Experiments with Sulfanilamide and with Its Derivatives in Hemolytic Streptococcal Infection. *J. A. M. A.* 104: 198 (May 2) 1935.

with our results on cultures of human marrow and blood. It would seem, therefore, that the experiments of Colebrook, Buttle and O'Meara were in themselves almost sufficient to establish the nature of the action of sulfanilamide and that they certainly strongly support our conclusions.

Another type of observation that has been difficult to explain is the effectiveness of a number of compounds¹⁰ which are not in themselves bacteriostatic but which break down in the body to yield sulfanilamide. The reason it has been difficult to explain the action of these compounds is that in the dosages employed the amount of sulfanilamide formed would give a concentration in the blood far less than the 1:10,000 which has been thought necessary for the effectiveness of sulfanilamide. However we have been unable to find records of any one having tried sulfanilamide in a dosage which would produce and maintain a concentration of 1:100,000 and our experiments indicate that this concentration would be effective. An example of this type of compound is prontosil soluble¹¹ which is highly effective in doses of 120 cc of a 2.5 per cent solution but this 3 Gm of prontosil could yield only 1 Gm a day of sulfanilamide whereas the doses of sulfanilamide designed to give a concentration of 1:10,000 are about 5 to 8 Gm a day. Furthermore Fuller¹² has shown that the blood of patients under successful treatment with prontosil may contain only about 1 mg of sulfanilamide per hundred cubic centimeters, or 1 part in 100,000. Gley and Girard¹³ believe that the sulfanilamide derived from some of these complex compounds will not explain their therapeutic activity. In their experiments however injections were given only once or twice a day and a slow breakdown to sulfanilamide maintaining an effective concentration for a longer time might explain the apparent superiority of the 'new derivative'. If a 1:100,000 concentration proves to be as effective in the human body as it is in our human marrow cultures, the effectiveness of these compounds is explained without the necessity of postulating the presence of some other active compound.

The observations by Long and Bliss⁴ also may be explained by our conclusions as to the mode of action of sulfanilamide. They noted that, on treating mice infected with streptococci with sulfanilamide or prontosil, a large percentage survived as long as the therapy was continued but that 'if the treatment was discontinued the mice began to die, some in the first few days, others as late as thirty days after the therapy had been discontinued'. This result could readily be explained if the sulfanilamide neutralized the toxins of the organisms but if because of their known low resistance the mice did not succeed in killing all of the streptococci. If this were the case after sulfanilamide was stopped the surviving streptococci would again multiply and form toxin, producing death. In table 1 of the article by Long and Bliss slowing of the

growth but failure to kill the streptococci in broth containing concentrations of sulfanilamide of 1:10,000 is recorded.

The rapid alteration in the clinical course of streptococcal meningitis¹⁷ erysipelas¹⁸ and scarlet fever¹⁹ is more easily explained on the basis of neutralization of toxin than on the basis of bactericidal action. In other words the effect of sulfanilamide in these infections is somewhat analogous to the action of antitoxin in diphtheria.

RESEARCH IMPLICATIONS OF THESE EXPERIMENTS

In many types of tissue culture research it may be desirable to add 1:100,000 sulfanilamide as this will materially decrease the danger of bacterial contamination without altering markedly the growth characteristics of the cells.

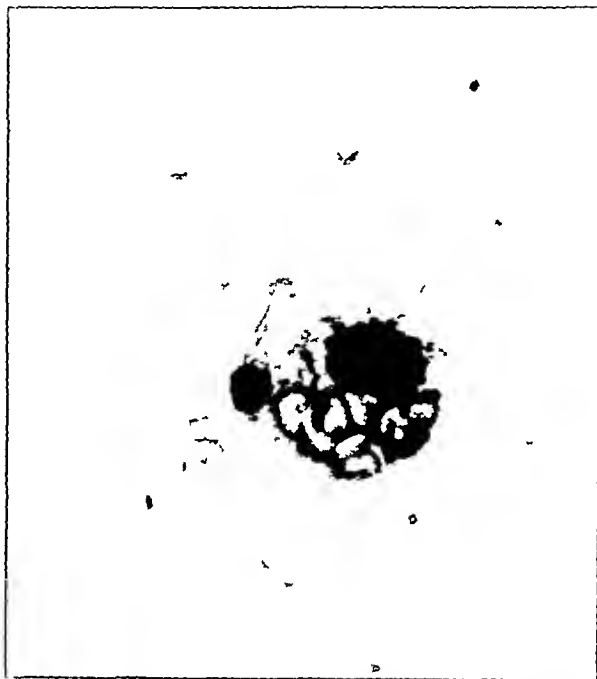


Fig. 4—Six day old culture of human marrow containing 1:10,000 sulfanilamide two days after inoculation with large numbers of beta hemolytic streptococci. $\times 1,200$. Note the phagocytosis of streptococci by a polymorphonuclear leukocyte (polymorphonuclear 11) in process of mitotic division.

Research designed to determine whether some other compound is superior to sulfanilamide must be so planned that the concentration of sulfanilamide derived from the drug is known at all times during the course of the experiment and controlled by experiments in which sulfanilamide is given in such dosage and at such intervals that the same concentration is maintained. The reason for this is that the continuous presence of a low concentration of sulfanilamide is more effective than the intermittent presence of a high concentration.

The mode of action of other micro-organisms should be determined by the methods here outlined, is soon as possible. It seems possible that it will prove effective against all organisms producing an exotoxin. Its

16 Trefouel J, Trefouel Mme J, Nitti F and Boyet Daniel. Activité de p-aminophénylsulfamide sur les infections streptococciques expérimentales de la souris et du lapin. *Compt rend Soc de biol* 120: 51 (1935). Levaditi C and Vaisman A. Action curative et préventive de chlorhydrate de 4 sulfamido-2,4 diaminoazobenzène et de quelques dérivés similaires dans la streptococcie expérimentale. *Presse med* 2: 209 (Dec 25) 1935. Gley P and Girard A. Un nouveau dérivé de la sulfamido-chlorure très actif contre l'infection streptococcique. *ibid* 2: 15 (Nov 11) 1935. Trefouel M, Trefouel Mme J, Nitti F and Boyet Daniel. Chimiothérapie des infections streptococciques par les dérivés du p-aminophénylsulfamide. *Ann de l'inst Pasteur* 78: 10 (Jan) 1937. Boyet Daniel. Recherches expérimentales dans le domaine de la chimiothérapie des infections bactériennes. *Schweiz med Wchn chr* 67: 88 (April 1) 1937. Journean E, Trefouel J, Nitti F, Boyet Daniel and Trefouel Mme J. Action antistreptococcique des dérivés sulfures cyaniques. *Compt rend Acad de sc* 204: 1763 (June 7) 1937.

17 Weinberg M H, Mellon R R and Shinn J E. Two Cases of Streptococcal Meningitis Treated Successfully with Sulfanilamide and Prontoil. *J A M A* 108: 1948 (June 3) 1937.

18 Seherber G. Zur lokalen und allgemeinen Behandlung des Erysipels in letzterer Beziehung mit besonderer Darstellung der Anwendung des Farbstoffpräparates Prontoil (Streptozon 1%) (rat 5214) wie der Behandlung reultate mit Omnydin. *Wien med Wchn chr* 85: 254 (March 9) 1935. Frankl J. Ueber den Wert des Prontoil in der Therapie des Erysipels. *Klin Wchn chr* 15: 15/3 (Oct 23) 1936. Kramer W. Ueber Erfahrungen bei der Erysipelbehandlung mit Prontoil. *München med Wchn chr* 83: 608 (April 10) 1937.

effectiveness against the gonococcus does not necessarily eliminate this possibility for it was only recently that toxin production by the closely related meningococcus was demonstrated and an effective antitoxin was produced

CLINICAL IMPLICATIONS OF THESE EXPERIMENTS

If our conclusions are correct, and a series of carefully controlled studies indicates that they hold true in the human body as well as in living human marrow cultures the following should logically govern the use of this type of therapy. The decrease in dosage then permissible would probably greatly decrease the incidence of the toxic effects now observed.

Therapy should be instituted at the earliest possible moment, since the effectiveness is greater if the number of organisms present is not too great.

Small doses at frequent intervals to maintain the concentration of the drug in the body fluids above 1:100,000 at all times should be more effective than larger doses at longer intervals.

There would seem from the data on absorption and excretion to be no object in giving sulfanilamide intravenously when oral medication is possible except for the first dose in very seriously ill patients.

Therapy should not be discontinued until cultures for the organism are negative, and after discontinuance the patient should be observed very closely and administration of the drug resumed immediately on the slightest indication of the recrudescence of the infection.

There would seem to be no object in using any of the protosols or any compound other than sulfanilamide itself in clinical work since these probably have to be changed to sulfanilamide before action can occur involving some unnecessary delay and making the control of concentration difficult. If adequately controlled research reveals a compound which is very slowly excreted, is nontoxic and breaks down to sulfanilamide slowly, maintaining a concentration of 1:100,000 in body fluids for long periods of time this compound might be desirable for use after an adequate concentration in the body fluids has been attained with sulfanilamide itself.

These experiments suggest that sulfanilamide should be of value in all infections due to the hemolytic streptococcus and also in conditions such as scarlet fever or glomerular nephritis in which the symptoms are due to the toxins alone of this organism.

Since the action of the drug is somewhat analogous to that of an antitoxin, its effectiveness in small repeated doses should be determined as a prophylactic in persons known to have been exposed to infections, as in epidemics of septic sore throat and of influenza with streptococcal pneumonia such as occurred in 1918.

The hit or miss treatment of very conceivable human infection with an agent known to be not without danger¹⁹ is not desirable since the possibility of effec-

tiveness of this agent against every microorganism known to produce human disease may be tested by controlled infections of living human marrow cultures such as are described here. Exceptions to this are justifiable in the case of the meningococcus²⁰ gonococcus¹ and pneumococcus type III²² infections in which clinical evidence justifying the use of sulfanilamide is already available. It may also be justifiable to try it in other infections for which there is no specific therapy if the patient is so ill that there is danger of death from the disease, although such use of the drug is hardly likely to add much to our knowledge of its usefulness.

Since this paper was accepted for publication we have shown that sulfanilamide apparently has no effect on infections with the alpha hemolytic streptococcus (*Streptococcus viridans*) or the hemolytic staphylococcus in marrow cultures, but that it does appear to have in concentrations of 1:10,000, a sufficiently favorable influence on the course of pneumococcal infections of types other than III to justify controlled clinical investigation of this agent as a supplement to serum in the treatment of pneumonia. With the collaboration of Dr. H. M. Powell and the Biological Division of Eli Lilly & Co., we have shown that it does not neutralize diphtheria toxin or tetanus neurotoxin in guinea pigs but appears to inactivate a certain fraction of freshly prepared *Perfringens* hemotoxin *in vitro*. Details of these experiments will appear in a subsequent paper.

SUMMARY

The major action of sulfanilamide on the beta hemolytic streptococcus seems to be neutralization of the toxins. Either because of this action or incidentally it also decreases the rate of cell division of this organism. It appears not to kill these organisms directly, although it does permit the bactericidal properties of human serum and to some extent phagocytosis by leukocytes to kill organisms which they otherwise would be unable to kill. It has no direct effect on phagocytosis.

The effective concentration of sulfanilamide would appear to be about 1:100,000 or only one tenth of that now ordinarily maintained in the blood stream, but this experimental observation requires confirmation by carefully controlled experiments on large numbers of human infections before it is justifiable to employ smaller dosages in dangerously ill patients. Sulfanilamide in concentrations even greater than those generally employed clinically does not appear to have direct toxic action on the nucleated cells of the majority of bloods or marrows. This does not exclude the occurrence of an occasional idiosyncrasy in the reactions of these cells such as is known to occur for other benzene ring drugs.

The possible effectiveness of and the mode of action of sulfanilamide on all other organisms known to produce human disease should be determined by the methods here described as soon as possible. Cultures of human marrow should not materially in the study of the mode of action of both novions and therapeutic agents.

19 Southworth Hamilton. Acidosis As occasioned with the Administration of Para-Amino-Benzene-Sulfonamide (Prontylin). *Proc. Soc. Exper. Biol. & Med.* 36:55 (Feb.) 1937. Hageman P. O. and Blake F. G. A. Specific Febrile Reaction to Sulfanilamide. *Drug Fever* J. A. M. A. 109:642 (Aug. 28) 1937. Kohn S. E. Anemia During Treatment with Sulfanilamide. J. A. M. A. 109:1005 (Sept. 25) 1937. Bucy P. C. Toxic Optic Neuritis Resulting from Sulfanilamide. J. A. M. A. 109:1007 (Sept. 25) 1937. Menville J. G. and Archinard J. A. Skin Eruptions in Patients Receiving Sulfanilamide. J. A. M. A. 109:1008 (Sept. 25) 1937. Goodman M. H. and Levy C. S. Eruption During Administration of Sulfanilamide. J. A. M. A. 109:1009 (Sept. 25) 1937. Frank L. J. Dermatitis from Sulfanilamide. J. A. M. A. 109:1011 (Sept. 25) 1937. Salvin Monte. Hyper sensitivity to Sulfanilamide. J. A. M. A. 109:1038 (Sept. 25) 1937. Newman B. A. and Sharlit Herman. Sulfanilamide. A Photo sensitizing Agent on the Skin. J. A. M. A. 109:1036 (Sept. 25) 1937. Harvey A. M. and Janeway C. A. The Development of Acute Hemolytic Anemia During the Administration of Sulfanilamide (Para-Aminobenzenesulfonamide). J. A. M. A. 109:12 (July) 1937. Frost Rort.

20 Proom H. The Therapeutic Action of Para-Amino-Benzene-Sulfonamide in Meningococcal Infection of Mice. *Lancet* 1:16 (Jan. 2) 1937. Schwenker F. F. Gelman Sidney and Long P. H. The Treatment of Meningococcal Meningitis with Sulfanilamide. J. A. M. A. 109:147 (April 24) 1937.

21 Dees J. F. and Colston J. A. C. Sulfanilamide in Cerebral Infections. J. A. M. A. 109:1855 (May 29) 1937.

22 Cooper F. J. Greig Paul and Mellon R. R. Action of Para-Aminobenzenesulfonamide on Type III Pneumococcus Infections in Mice. *Proc. Soc. Exper. Biol. & Med.* 36:1-8 (March) 1937.

PYELONEPHRITIS WITH NEPHRO-
CALCINOSISCAUSED BY HAEMOPHILUS INFLUENZAE AND
ALLEVIATED BY SULFANILAMIDE REPORT
OF TWO CASES

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It is our object in this paper to report the histories of two patients with almost identical clinical manifestations. In so doing, we believe that we are reporting a hitherto undescribed disease entity as well as demonstrating its specific etiologic factor and its treatment.

The histories will appear later. The essential facts, however, can be briefly summed up as follows. Case 1 first came to our attention because roentgenograms showed multiple calcium deposits in the pyramids of both kidneys as well as kidney stones (fig 1). This finding in adults had hitherto been considered almost pathognomonic of hyperparathyroidism,¹ and a presumptive diagnosis of that condition was made. Calcium and phosphorus studies, however, were normal which ruled out such a diagnosis. It was then noted that the roentgenogram of the kidneys differed from roentgenograms of cases of hyperparathyroidism with nephrocalcinosis in that the calcium deposits were of unequal size and quite large as compared with the fine stippled areas in that condition. Further studies revealed the fact that the patient's urine was constantly alkaline despite many attempts to make it acid and it seemed probable that the calcium deposits were due to the precipitation of calcium phosphate from an alkaline medium. Urine cultures repeatedly showed small gram-negative bacilli, which remained unidentified for some time. There the study came to a temporary standstill, the impression having been arrived at that the calcium deposits in some way were due to an alkaline medium resulting from ammonia formation by the unidentified bacillus.

Seven months later the roentgenogram of the kidneys in case 2 was seen and its similarity to that in case 1 was recognized. The urine in this case also was found to be alkaline. It was predicted that the unidentified bacillus would be present in the urine and it was. With this impetus more detailed bacteriologic studies were done.

The bacilli grew as small transparent colonies on blood agar plates. Further studies revealed that the cultures obtained in both cases belonged to the hemophilic group of bacteria. Growth never occurred either in liquid or in solid mediums without the presence of blood of which only a very small amount was needed. The growth requirements of the strains seemed to correspond to those of the true influenza bacillus. Morphologically the bacillus, as seen both in the urine and in cultures, corresponded to the influenza bacillus. The blood serum of one patient markedly agglutinated both strains while the serum of the other

patient did not agglutinate either one. These observations indicated the close relationship of the strains. The classification of hemophilic bacilli is confusing at present and it cannot be decided with certainty whether the strains do or do not correspond in every respect to the respiratory or meningeal strains of influenza bacilli.

Finally, sulfanilamide therapy was tried on both patients with prompt disappearance of the organism and the production of an acid urine.

REPORT OF CASES

CASE 1—S. M., an Italian aged 41, married, a grocer admitted to the urologic service Aug. 20, 1936, complained of bilateral costovertebral and lumbar pain of one month's duration.

The past history was of interest in that the patient had had three attacks of painful swelling with redness of the right large toe during the past four years. In all three instances he had been confined to his bed for several days but recovery had been complete without any residual joint symptoms.

There were no physical abnormalities except some bilateral costovertebral tenderness and hypospadias. There were no tophi and no joint changes. The blood pressure was 120 systolic, 70 diastolic. The retinal vessels appeared to be normal.

Roentgenograms showed large kidneys with calculi in both renal pelvis and also in all the pyramids (fig 1). An intra-

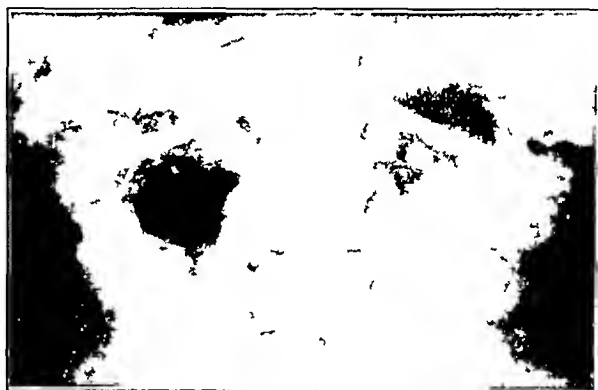


Fig 1 (case 1)—Appearance of kidneys

venous pyelogram showed that the dye was excreted well by both kidneys and failed to show any hydronephrosis.

Laboratory studies showed the urine cloudy with specific gravity 1.008, albumin ++, pH 7.5, no marked increase of calcium in urine sediment loaded with white blood cells and with small gram-negative bacteria. The serum contained 30 mg of nonprotein nitrogen, 10.6 mg of calcium, 3 mg of inorganic phosphorus, 67 Gm of protein and 3.9 mg of uric acid per hundred cubic centimeters. Phenolsulfonphthalein was excreted normally. The specific gravity of the urine varied between 1.003 and 1.010 during a concentration test. An analysis of the calculi showed them to be predominantly phosphates. The urine remained alkaline on all occasions.

Frequent cultures of the urine over a period of eleven months always showed the presence of *Haemophilus influenzae*.

An attempt was made to acidify the urine by giving the patient the Higgins acid ash diet and 120 grains (8 Gm.) of ammonium chloride daily by mouth. Although acidosis of the blood was produced (carbon dioxide combining power 43.3 volumes per cent and plasma chlorides 113 milliequivalents per liter), the urine still remained persistently alkaline. It was therefore concluded that *Haemophilus influenzae* was probably capable of splitting urea. This was difficult to verify by *in vitro* studies because the bacterium grew very poorly in our mediums if urea was added.

Various forms of therapy were tried without success. The patient continued to form and pass hundreds of stones from both kidneys. Vaccines were made from the organism recovered from the patient's urine and were administered without effect.

From the Department of Medicine of the Massachusetts General Hospital and of the Harvard Medical School and the Department of Pathology and Bacteriology of Massachusetts General Hospital.
1 (a) Albright, Fuller. Hyperparathyroidism: Its Diagnosis and Exclusion. *New England J. Med.* 209: 476 (Sept. 7) 1933. (b) Albright, Fuller, Burd, P. C., Cope, Oliver, and Bloomberg, F. *Studies on the Physiology of the Parathyroid Glands.* *Am. J. Sc.* 187: 49 (Jan.) 1933. (c) Litinger, Alice, and Magendanz, Heinz. *Koenig's Evidence of Extensive Calcification of Kidneys in Ocular Fibrosis.* *Am. J. Roentgenol.* 31: 593 (May) 1934.

Finally, as will be discussed later sulfamidamide was administered. *Haemophilus influenzae* promptly disappeared and the urine became acid.

CASE 2—J D, an Italian laborer aged 49 married admitted to the urologic service March 24, 1937, complained of hematuria of two months duration. Three months before admission while lifting a heavy weight he felt something "snap" in the lumbar region. His back became so painful that it was necessary for him to be confined to bed and he was unable to turn on his side without having severe pain. His back was strapped and he remained in bed for three weeks. The pain was relieved when fluids were forced and also when he voided. One month after the onset of the illness hematuria developed, which lasted four days. This was associated with burning on urination, frequency, nocturia and a turbid urine all of which persisted up to the time of admission to the hospital. He gave no history of chills, fever or passage of urinary stones.

The past marital and family histories were noncontributory. Physical examination was normal except for bilateral costo vertebral tenderness. The blood pressure was 140 systolic, 90 diastolic. The retinal vessels appeared normal.

An x-ray examination of the kidney region revealed extensive diffuse calcification of the pyramids of both kidneys (fig. 2).

Laboratory studies were as follows: The urine was turbid, pH 7.0, specific gravity 1.012, sediment loaded with white blood cells and small gram negative bacilli. The serum contained 10.9 mg of calcium, 3 mg of inorganic phosphorus, 6.2 Gm of protein, 22 mg of nonprotein nitrogen and 10.6 milliequivalents of chloride per hundred cubic centimeters. The small bacillus was constantly present and was later identified as *Haemophilus influenzae*. The specific gravity on a urine concentration test showed fixation of gravity between 1.008 and 1.012. The phenolsulfonphthalein excretion however was normal.

The administration of oral acidifying agents were no more successful in producing an acid urine than in the first case. Vaccines were made from the organism recovered from the



Fig. 2 (case 2)—Appearance of kidneys

patient's urine and administered without effect. Sulfamidamide was administered with prompt production of an acid urine and the prompt elimination of *Haemophilus influenzae* from the urine.

COMMENT

A review of the literature has revealed no instance of kidney disorder which seemed exactly analogous to the two cases here reported. One gets diffuse calcification of the kidneys in parathyroid poisoning² and with overdosage with vitamin D and dihydrotachysterol

2 Hueper, Wilhelm. Metastatic Calcifications in the Organs of Dog After Injections of Parathyroid Extract. *Arch. Path. & Lab. Med.* 3: 14 (Jan.) 1927.

(referred to in the German literature as A. T. 10). In these three conditions however, the calcified areas are microscopic in size and do not show by roentgenogram. Furthermore, the calcification is not limited to the pyramids. In hyperparathyroidism with nephrocalcinosis (as opposed to parathyroid poisoning)³ one gets calcium deposits in the pyramids which may show by roentgenogram. The appearance however is dif-



Fig. 3—Appearance of kidneys in case of hyperparathyroidism with nephrocalcinosis previously reported (Albright, Baird, Cope and Bloomberg⁴; Eitinger and Magendanz⁵).

ferent. Butler⁶ in a footnote reported a case of little rickets in a 10 year old boy who likewise had diffuse calcification of the pyramids of both kidneys. At operation the calcium deposits were found to be in the kidney parenchyma. Some material was removed however, which on analysis showed a calcium carbonate phosphate compound of the composition of bone. An almost identical case to that of Butler was studied recently at this clinic and will be the subject of a separate report. In the latter case urine cultures were sterile. In certain cases of obstruction of the upper intestinal tract in which there is dehydration, hypochloremia and alkalosis calcification of the kidney tubules develops.⁷ Butler has also reported calcification of the tubules in infants with histories suggesting dehydration. Mercury poisoning may lead to a condition associated with calcification of the pyramids which is visible by roentgenogram.⁸ In experimental pathology, calcification of the kidney can be caused by uranium and oxalate poisoning. Crabtree⁹ reported three cases of focal deposits of calcium in the kidney tubules in patients with *Bacillus coli* infections.

Influenza bacilli are known to produce suppurative processes in many organs. Besides the more fre-

3 Holtz, F. Die Behandlung der postoperativen Tetanie. *Arch. Klin. Chir.* 177: 32 (1933).

4 Butler, A. M., Wilton, J. I., and Farber, Sidney. Dehydration and Acidosis with Calcification of Renal Tubules. *J. Pediat.* 9: 489 (April) 1936.

5 Brown, G. F., Eusterman, C. I., Hartman, H. R., and Kewter, I. C. Toxic Nephritis in Pyloric and Duodenal Obstruction and Insufficiency Complicating Cystic Tetany. *Arch. Int. Med.* 72: 4 (Sept.) 1923.

6 Cooke, A. M. Calcification of Kidneys in Typhoid. *Sienosis Quart. J. Med.* 2: 339 (Oct.) 1933.

7 Pugh, W. S. Calcification of the Kidney. *Lancet* & *Curr. Res.* 21: 208 (April) 1927.

8 Crabtree, E. G. Calcification Within Tubules of Kidney in Association with Urinary Tract Infection. *Tr. Am. A. Genit.-Urin. Surg.* 23: 17 (1919).

quent localization in the respiratory tree pleura heart valves, subarachnoid space and joints suppurative processes in the genito-urinary tract have been described in the urethra,⁸ in Bartholin's gland⁹ in the fallopian tubes¹⁰ and in the kidney pelvis.¹¹ Kretz¹¹ in 1898 reported the isolation of the influenza bacillus from the urine of a patient aged 36. No history of calculi was mentioned. He did note that the urine quickly became alkaline on standing. Davis¹² described three cases from which he isolated from the urine a hemophilic bacillus, which he found different in many features from *Haemophilus influenzae*. His first patient with this condition was a man of 41 who gave the history of having had turbid urine for at least eight years and possibly much longer. Thirty years previously he probably had passed a small stone. The urine was constantly alkaline and contained pus. Roentgenograms, however, failed to reveal stones. Both of the other two cases presented joint symptoms, only one showed an alkaline urine, neither showed evidence of kidney stones. Wright¹³ grew the influenza bacillus post mortem on a kidney showing the lesions of pyelonephrosis said to have been due to calculi. Unfortunately, no clinical history was available in this case.

The question arises from what source the infection came. Some observations of Nye¹⁴ throw considerable light on this question. He has been able to isolate hemophilic, influenza-like bacteria from the normal cervix and vagina and has found similar organisms in the blood stream in cases of puerperal infection.

It is of interest that both of our patients in spite of such extensive kidney disorder, did not suffer from renal insufficiency. However, whereas the phenol-sulfonphthalein excretions were normal, there was inability to concentrate in both cases. Butler⁴ in his cases presenting tubular calcification has called attention to hyperchloremia and acidosis. The same changes were obtained in this clinic in cases presenting nephrocalcinosis resulting from hyperparathyroidism. The

therapy were known the possibility was considered that the alkaline urine might have been partly due to this impaired excretion of acids. However, the fact that the urine became acid after the influenza bacillus was eliminated makes it probable that the infection was the chief factor.

It is of course impossible to say just why infection with the influenza bacillus produces such peculiar lesions and why the calcareous deposits occur in the kidney parenchyma itself. Because of this fact the

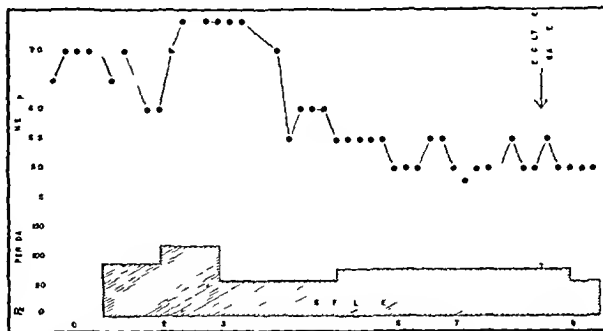


Fig. 5 (case 2).—Effect of sulfanilamide on urine pH and culture. Urine cultures were taken at intervals. Urine culture negative refers to *Haemophilus influenzae*.

condition is considered a pyelonephritis rather than a pyelitis. The influenza bacillus has more tissue-invasive properties than the proteus bacillus, which is an important cause of stone formation. This might explain why in an infection with the former the stones are intrarenal as well as in the kidney pelvis. One would like to hypothesize an ascending infection of the kidney tubules with the bacteria and a splitting of urea with ammonia formation in the substance of the kidney itself. Proof of such a supposition will have to await histologic material.

Long and Bliss¹⁵ found that a 1:10,000 concentration of sulfanilamide in serum broth markedly inhibited the growth of both *Haemophilus influenzae* and *Haemophilus haemolyticus*. These investigators, however, have had no success with this drug in *Haemophilus influenzae meningitis* or pneumonia.¹⁶

Figures 4 and 5 show the effect of sulfanilamide therapy in producing an acid urine and a negative culture to *Haemophilus influenzae*. The fact that the two charts have about the same time relations is of interest. The impression has been gained in this clinic that different strains of bacteria require different times to be eradicated in the urine by sulfanilamide therapy. *Haemophilus influenzae* seems to require an extraordinarily short time, judging by the rapidity of fall of the pH of the urine (figs. 4 and 5). Too little time has elapsed to allow one to judge how permanent the cures will be and whether further courses of treatment will be necessary.¹⁴

SUMMARY AND CONCLUSIONS

1. In two adult male patients, roentgenograms of the kidneys showed multiple calcium deposits in the

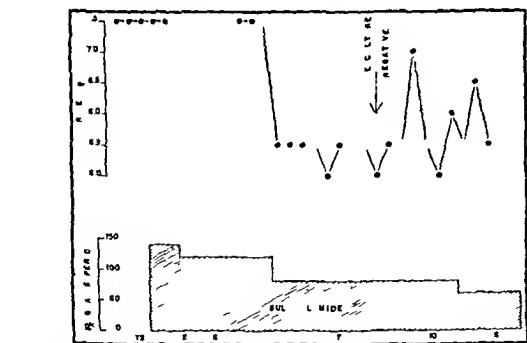


Fig. 4 (case 1).—Effect of sulfanilamide on urine pH and culture. Urine cultures were taken at intervals. Urine culture negative refers to *Haemophilus influenzae*.

serum chloride in case 2 on admission was high, 106 milliequivalents per liter, and in both patients hyperchloremia developed on moderate doses of chloride acidifying agents. Before the results of sulfanilamide

⁸ Cohn, P. Eine primäre nicht gonorrhöische Urethritis mit aufsteigenden reichlichen Influenzabacillen. Deutsche med. Wochenschr. 31: 1152, 1905.

⁹ Koch, T. E. and Kramer, E. Influenzabakterien bei Bartholinitis. München med. Wochenschr. 78: 1131 (July 3) 1931.

¹⁰ Kretz, R. Influenzabacillen bei Pyo- und Hydrovagina. Zentralbl. f. Bakt. 41: 701, 1906.

¹¹ Kretz, R. Zur Bakteriologie der Pyelitis. Wien. Klin. Wochenschr. 11: 91, 1898. Davis, J. D. A Hemophilic Bacillus found in Urinary Infections. J. Infect. Dis. 599: 1910. Wright, J. D. An Observation on the Occurrence of the Bacillus of Influenza (Bacterium Influenzae) in Pyelonephrosis. Boston M. & S. J. 172: 496, 1903.

¹⁴ Nye, R. A. Personal communication to the author.

¹⁵ Long, P. H. and Bliss, Eleanor A. Para-Amino-Benzene Sulfonamide and Its Derivatives. Experimental and Clinical Observations on Their Use in the Treatment of Beta Hemolytic Streptococcal Infection. J. A. M. A. 108: 32 (Jan. 2) 1937.

¹⁶ Long, P. H. Personal communication to the authors in March 1937.

¹⁷ The infection with *Haemophilus influenzae* occurred in both cases. Patient 2 was readmitted to the hospital for further therapy. Sulfanilamide again caused a negative urine culture which later again became positive. It is now proposed to give the patient repeated short courses of treatment.

pyramids. The deposits were larger and of less uniform size than those seen in the nephrocalcinosis of hyperparathyroidism.

2 In the urine of both patients, small gram-negative bacilli were present which were identified as *Haemophilus influenzae*.

3 The urine of both patients was constantly alkaline probably owing to the property of *Haemophilus influenzae* to split ammonia from urea and the calcium deposits were presumably due to the alkalinity so produced.

4 Sulfanilamide therapy promptly eliminated *Haemophilus influenzae* from the urine with a resulting acid urine.

CALCINOSIS CUTIS

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Calcinosis cutis may be defined as a pathologic state in which calcium deposits are laid down in the skin and subcutaneous tissues. As such it must be differentiated from other conditions such as myositis ossificans, calcification of hematomas, calcified tumors, phlebotomias, atheromas, calcified tubercles or calcified lesions due to parasites such as *Trichinella*, the calcification in cysts or even the production of osteomas in the skin. With these pathologic states left out of consideration one has left two main syndromes, one of which is not connected (supposedly) with parathyroid activity and which Epstein¹ terms idiopathic calcinosis cutis, and the other, which may be accompanied by definite evidence of hyperparathyroidism even if no adenoma may be clinically or surgically discovered. However, if no evidence is at hand to designate hyperparathyroidism definitely, all the bones and the musculature of the patient being perfectly normal and all the symptoms and signs pointing to the particular area that is involved with the calcification we prefer to classify these among the cases of idiopathic calcinosis rather than as examples of hyperparathyroidism. We agree with Epstein in not including the cases of calcification associated with scleroderma, dermatomyositis, Raynaud's disease or local arteriosclerosis, since in these conditions the calcinosis appears to be due to local conditions. Two cases are presented, following an outline of the subject.

ETIOLOGY

The causation is unknown. Since the majority of patients are females, an attempt has been made to involve endocrine disturbance. Malonev and Bloom² reported a case in which a boy presented definite female characteristics. Hubbard and Wentworth³ reported a case of metastatic calcification associated with chronic nephritis and hyperplasia of the parathyroid. They noted that parathyroid tumor associated with hypercalcemia often results in the deposition of calcium in many locations but particularly in the excretory organs of the body including the skin. Epstein would place

these in a separate category since the involvement is not limited to the skin alone. The two cases presented here show involvement of the skin exclusively. The widespread nature of the condition at once rules out trauma as a definite factor. Bohm⁴ considered that the calcification follows a degenerative process affecting the fat lobules, but the studies of Bauer, Marble and Bennett⁵ showed that such necrosis does not occur in the fat cells.

CALCIFICATION

In calcareous infiltration there is a deposition either in the cells or in the intercellular substance of larger and smaller granules, composed chiefly of calcium phosphate and carbonate. Normal skin does contain a small amount of calcium, but this is not sufficient to be noted under the microscope. When the collection of these granules becomes abundant enough there is a hardness, a brittleness and a whitish appearance of the affected tissue. Under the microscope they appear dark by transmitted and white and glistening by reflected light. These pathologic calcifications are retained not in the diffuse state in which they exist in bone but in particles or clumps.⁶ The calcium compounds however are the same in both normal and pathologic states, as has been shown by Wells.⁷

Calcification usually occurs in tissues that are dead or in a condition of reduced vitality and fatty degeneration frequently precedes the calcification. Such examples may be seen in the development of bone in enchondromatous ossification, calcification which follows the death of the cartilage. But Bauer, Marble and Bennett⁵ state that the initial histopathologic change in cutaneous calcinosis consists of a deposition of fine granules of calcium salts around apparently normal fat cells in the subcutaneous tissue. This is not accompanied by necrosis or acute inflammatory change. These granules become heaped up to form clumps or small tumors that replace the normal fat. These deposits of calcium are foreign bodies, and it is not surprising to note the formation of a foreign body reaction with the development of a granuloma, consisting of giant cells, slight fibrosis and round cell infiltration.

Since no degenerative process precedes the calcification one must look to general factors that influence the deposition of calcium salts. The latter are derived from the blood and lymph, in which they are held in solution. The controlling factors in calcium metabolism as far as our present knowledge goes, is the ratio between the calcium and the phosphorus, the parathyroid hormone, vitamin D and sunlight or ultraviolet rays. Increased intake of vitamin D has not been noted in any of the cases nor has undue exposure to sunlight or to ultraviolet rays. The laboratory observations will be discussed later.

PATHOLOGY

The pathologic changes consist essentially of a deposition of calcium salts in the skin, subcutaneous tissue and superficial fascia. It does not seem to go more deeply. Jadassohn⁸ stated that the calcareous material lies in the true skin⁹ and that it is distinctly

From the Department of Orthopedic Surgery, Christ's Hospital, 11 E. Calcinosis Cutis. Arch. Dermat. & Syph. 21: 950 (June) 1930.

2. Malonev, E. R. and Bloom, David. Cutaneous Calcinosis. Arch. Dermat. & Syph. 20: 245 (Feb.) 1931.
3. Hubbard, K. S. and Wentworth, J. A. A Case of Metastatic Calcification Associated with Chronic Nephritis and Hyperplasia of the Parathyroid. Proc. Soc. Exper. Biol. & Med. 15: 307 (1920/21).

4. Bohm, Mason. Calcinosis. Brit. J. Dermat. 47: 340 (Aug. Sept.) 1935.

5. Bauer, W., Marble, Alexander and Bennett, C. A. Further Studies in Calcification of Subcutaneous Tissue (Calcinosis Universalis) in a Child. Am. J. M. Sc. 192: 237 (Aug.) 1931.

6. Delfield, Francis and Prudden, F. M. Textbook of Path. New York, William Wood & Co.

7. Wells, H. G. Chemical Pathology. Philadelphia, W. B. Saunders Company, 1925.

8. Jadassohn, J. Kalkmetastasen. Arch. f. Dermat. u. Syph. 126: 172 (1919).

9. Epstein, Ervin. Idiopathic Calcinosis Cutis. Arch. Dermat. & Syph. 21: 367-377 (Sept.) 1930.

disturbed, affecting also the elastic fibers. As will be noted in the roentgenogram, there is a definite clumping of the granules of calcium, with an interlacing network attaching the clumps together. The tumor-like masses are not definitely encapsulated although they are surrounded with granulomatous tissue and therefore they cannot be surgically enucleated without removal of some of the adjacent tissues. Not all of the clumps are hardened, some of them when opened allow a creamy-like material to ooze out slowly and this soon hardens on drying. When many of these clumps are diffusely distributed throughout the skin, the area may have a wooden feel as in lymphedema, although nodules that have become hardened can be felt here and there.

SYMPTOMATOLOGY

Since the process is not attended with degenerative or inflammatory changes, it is not surprising that in the literature pain was not a constant symptom. However, in both of our cases this was the predominant symptom that brought the patient to the clinic. It is to be expected that pain will be present only in the later stages when complications arise. The skin over the concretion remains normal, especially in the early stages, but Epstein⁹ does record a case in which the skin was dry, scaly and atrophic. In the early stage the masses are freely movable over the underlying tissues, showing that they are above the deep fascia. On inspection, it can be noted that there are nodules resulting from the elevation of the skin over some of the larger nodules. The skin usually appears normal unless complications have set in. All the patients in the literature presented the involvement in the extremities or the pelvis. On the hands, the most common region involved is the palmar aspect of the distal phalanx, but deposits may also occur on the dorsa or sides of the fingers. With reference to the pelvis the common locations are on the buttocks, the lower portion of the back, the scrotum, near the iliac crest and over the ramus of the pubis. In addition rare cases are seen in which nodules are present in the male region, the ear, the chest and the abdomen, one example of each being recorded by Epstein⁹. There is a tendency for symmetrical involvement. On palpation, the tumors or nodules are found to be stony hard, and the skin around the nodule may be somewhat tense and wooden. The nodules may seem to be encapsulated on palpation but this is shown to be erroneous in the roentgenogram. If care is exercised, several smaller nodules can be felt, with radiating streaks of hardness connecting them.

Older nodules may break down and discharge a thick white creamy material, which oozes out slowly from the sinus that has developed. This occurred in about half of the cases recorded in the American and English literature. Around the sinus a hard yellow ring may form, and small concretions may be discharged from time to time which will resemble small sequestrums or small masses of urates. They crumble on pressure and therefore are distinguished from sequestrums. They are radiopaque and therefore differ from urates, which are radiotranslucent. On chemical analysis they are found to consist of calcium salts. When the sinus is formed the skin about it becomes somewhat hard and wooden and is attached to the underlying mass. The region about the sinus may then become secondarily infected and the picture of suppuration is then superimposed. This is the stage at which most pain is complained of. As a result of

infection or disturbance in the vascular supply of the region, ulceration may occur. The ulcer is somewhat punched out, and the base of the ulcer may contain these yellowish plaques of calcium. The borders of the ulcer are lined with a hardened yellow rim. When an abscess becomes walled off under the skin, the signs and symptoms of suppuration develop in the region plus the general symptoms of fever and malaise.

Although pain is not a prominent symptom in the majority of cases, this depends on the location of the deposit. Deposits on the tips of the fingers or toes may be painful and tender to pressure. At times there is a prodromal stage of marked pain and stiffness in the muscles and joints which precedes the diagnosis of cutaneous calcinosis by some months. Epstein does not believe that this incidence has been satisfactorily



Fig. 1 (case 2)—Appearance of both legs of patient

explained we believe that they are merely a general manifestation of disturbance in calcium metabolism just as is seen in cases of hyperparathyroidism.

LABORATORY INVESTIGATION

The routine examination of the blood, the urine and the stool does not yield pathologic data. The Wassermann and Kahn reactions are negative in all the cases. The blood chemistry as a general rule is normal but the phosphatase content of the blood was elevated in one case and the calcium varied from 8.4 to as high as 13 mg. In the case recorded here there was definite elevation of the calcium in the blood.

The tumors are radiopaque and show the definite clumping of the masses of calcium, which are connected together by an irregular network of strands of calcium. The tumors are located in the soft tissues and can be moved over the underlying structures and can be proved by doing this under the fluoroscope. The bones are perfectly normal and show no evidence of decalcification. The masses may reach any size

although in our cases they were not over half an inch in diameter. Epstein records one mass that was 95 mm in diameter on the roentgenogram.

TREATMENT

The use of endocrine preparations in treatment has been ineffectual, as has sympathectomy and surgical intervention locally. Bauer, Marble and Bennett⁹ advise ammonium chloride therapy to increase the calcium output, and Kennedy¹⁰ used a ketogenic diet. Epstein advises a low calcium, low vitamin D diet. He states that an acidifying agent and phosphorus given orally aid in the calcium elimination and prescribes disodium hydrogen phosphate. He advises the use of artificial hyperpnea but condemns local diathermy. We found local diathermy (short wave) very useful in controlling pain in one patient. Symptomatic treatment consists in relieving pain by the use of diathermy or local applications, the treatment of suppuration by opening abscesses or applying moist dressings for inflammatory areas. If a nodule is troublesome, it may



Fig. 2 (case 2) — Appearance of ulcerated areas on x-ray examination

have to be removed surgically. If there is hypercalcemia, we recommend irradiation of the parathyroids, especially if the patient is elderly.

PROGNOSIS

From the standpoint of cure the prognosis is poor, especially in elderly patients. Relief of pain can usually be obtained. The nodules have no tendency to become malignant, nor does it spread to the deeper layers of the body; they simply

remain as foreign bodies. We believe that all patients should be treated carefully, preferably in the hospital, where complete consideration can be given to the case. They may sometimes stimulate other conditions, notably chronic ulcer, varicose ulcer and malignancy, and may give the extremity surgeon much concern unless he is on the lookout for the condition.

REPORT OF CASES

CASE 1—W. H., a white woman aged 56 who came into the Orthopedic Clinic during November 1933 with the essential complaint of pain in the right leg began to have rheumatic pains in the right knee and foot and some slight pains in the right groin about four years before. These gradually cleared up but the pain in the right leg remained. She had noticed that the skin of the leg had hardened. In the last six months the pain had become somewhat sharper and more localized to the anterolateral aspect and a small lump appeared. The very apex of this swelling had ulcerated slightly and from it a small piece of dead bone had extruded. Past illnesses were uneventful. The family history was essentially unimportant. The patient was fairly well developed and well nourished with no disturbance in gait. Examination was essentially negative except for the right leg. There was one large nodule about

1½ inches (3.8 cm.) in diameter on the anterolateral aspect on the middle third of the leg and around it were several smaller nodules. There was a small ulceration over the apex of the larger nodule about one half inch (1.3 cm.) in diameter and the base of this ulceration was of a peculiar yellow. Roentgenograms showed several areas of calcification with some interlacing between them. Roentgenograms of the left leg were negative. Examination of the blood and urine was essentially negative. The Wassermann and Kahn reactions were negative. The calcium of the blood was perfectly normal. The diagnosis was possible calcification of a hematoma even though there was no history of trauma. Under local anesthesia the large nodule was removed and it was found that in its removal some of the surrounding healthy tissues had to be included since it could not be enucleated. Owing to financial difficulties the patient was treated as an outpatient. She made an uneventful recovery, although slight suppuration followed. Examination of the nodule proved it to be composed of calcium salts. The diagnosis was later changed to idiopathic calcinosis cutis.

CASE 2—Mrs. R. K. M., a white woman aged 72, a widow who entered the orthopedic service of Christ's Hospital in October 1936 complained of a chronic ulcer of the left leg. She stated that about seven years before she had an attack of pain which was soon followed by ulceration of the posterior surface of the middle third of the left leg. She was seen by her family physician who applied an ointment. Since it did not heal she was referred to a general surgeon who made a diagnosis of varicose ulcer, although there were no definitely enlarged veins. At this time there was no discoloration of the leg. The surgeon applied various moist dressings and ointments, and after some time the ulcer healed. Even at this time some small pieces of bone¹ escaped from the ulcer in the acute stage. She remained perfectly well until about one year before admission at which time several small sinuses appeared over the anteromedial and posterior aspects of the same leg. Prior to the appearance of the sinuses she had much pain and this was of a severe nature. She was unable to sleep because of it. When the sinuses broke open the pain was not as severe, but it still kept her from sleeping. There was much discharge from the region and this was of a thick creamy nature with now and then a small piece of bone. She again called the general surgeon who applied essentially the same treatment as before but this time the lesion did not heal; in fact it became worse and all the small sores coalesced resulting in a large ulcer. The discharge was no longer thick and creamy but watery but still some small pieces of bone¹ were thrown off from the ulcer. She had seen several physicians and the opinion of most of them was that either she had an infection of the bone or she had a tumor. The last physician told her that it might be malignant and advised her to see a bone specialist.

The family history of the patient was essentially negative for any significant diseases. She had the ordinary diseases of childhood and some liver trouble in years past but did not recall that any definite treatment was given her. She had been told that she had a weak heart but had never complained of shortness of breath. Prior to the beginning of the condition seven years earlier she had some trouble in the muscles and joints diagnosed by her family physician as arthritis.

The patient was fairly well developed and well nourished. The shape of her head was normal and there was no tenderness over the sinus regions. The eyes were perfectly normal and the pupils were round and equal and reacted to light and in accommodation. She was edentulous and the tonsils were normal, although somewhat shrunk. There was no rigidity or stiffness of the neck and there were no glandular enlargements. The thyroid could not be palpated. The chest was well developed with no deformities and the breasts were normal. The heart was not enlarged, the heart sounds were normal and there were no adventitious sounds. Resonance of the lungs was normal, the breath sounds were normal and there were no adventitious sounds. The abdomen was normal with no fulness, tenderness or rigidity or masses and the soft organs were not palpable. The reflexes were normal. Her

10. Kennedy, R. L. J. *Calcinosis. Presentation of a Case.* *Proc. Staff Meet., Mayo Clin.* 329 (June 8), 1932.

was a fairly large serpiginous, punched out ulcerated area over the lateral and somewhat posterior aspects of the leg. The base of this was covered with a slimy material in which were embedded small masses of irregular shape and size which were probably deposits of calcium. These masses could be removed from the area but there were so many of them that the area could not be cleaned. They were not only embedded in the ulcer itself but extended under the edges of the ulcer under the skin. There was an area of a purplish red all round the ulcerated area. The skin in the region had a peculiar nodular appearance as if there were small nodules under the skin. On palpation it was found that the skin and subcutaneous tissues were studded with these small nodules not only in the immediate region of the ulcer but all round the leg from the ankle almost to the knee. The skin in the immediate vicinity of the ulcer had a hard wooden feel and seemed bound down to the underlying nodules. As one receded from the ulcer however, while the same nodules could be felt the skin was almost normal in appearance and the skin with the nodule could be moved over the underlying tissues. The right leg was similarly affected but there was no discoloration and no ulceration. The nodules could be felt, as on the left but the skin and the nodule could be moved quite freely over the underlying tissues.

The Wassermann and Kahn reactions were negative. The red blood cell count was 3,900,000 with a hemoglobin of 65 per cent. The white blood cell count was 6,000 with 44 per cent polymorphonuclear leukocytes and 56 per cent lymphocytes. Examination of the urine was negative but the calcium of the blood was 15.0 mg. The uric acid in the blood was 3.1 mg. The roentgenograms of the legs are shown in figure 2. A ray examination of other areas of the body including the upper extremities and the skull did not reveal bony changes aside from atrophic changes in both knees.

The diagnosis made was (1) cutaneous calcinosis, (2) hyperparathyroidism? (3) ulceration with secondary infection and (4) secondary anemia. On general principles she was given irradiation to the parathyroid region by the roentgenologist. Also she was placed on alternating diets, one day a ketogenic and one day a low calcium low vitamin D diet and was given disodium hydrogen phosphate orally. At first moist applications were applied to the ulcerated area, dilute solution of sodium hypochlorite or weak potassium permanganate solution being used until the area was cleared up of definite suppuration. On several occasions masses of calcium were removed from the wound with forceps. Short wave diathermy was applied since this seemed to give the patient much comfort and was also a means of applying heat to the region. In three weeks the ulcerated area was fairly clean and granulations were covering it; there was no further pain but roentgenograms showed no appreciable change at all in the legs. An elastoplast dressing was applied and the patient was discharged stating that she had no pain and was able to walk without difficulty. The patient subsequently fell and fractured the left humerus. She was treated for this by her family physician. She made a good recovery but for some reason her condition suddenly took a turn for the worse and she died. Autopsy was not permitted.

SUMMARY

In the two cases of idiopathic calcinosis cutis here reported the diagnosis was missed in one and made directly in the other. Although there are only eighteen such cases in the American and English literature, there are many references to this condition and the fact that several authors have had experiences with two cases indicates that it is not as rare as it was formerly thought to be. To the extremity surgeon this may present certain problems especially in diagnosis. The condition can be detected very early in the history of the case provided the physician or surgeon is on his toes. Although the prognosis from a curative standpoint is poor, from the standpoint of symptomatology it is good.

605 Mills Building

Clinical Notes, Suggestions and New Instruments

DERMATITIS DUE TO SHOE LEATHER

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Bloch,¹ Lewis,² Stauffer,³ Grasreiner,⁴ Anderson and Ayres,⁵ Lanzenberg,⁶ Simon and Rackemann,⁷ and Beerman⁸ have reported cases of dermatitis venenata due to shoe leather and in 1934 Beerman made an exhaustive review of the literature on leather dermatitis. Although many other instances of dermatitis from this cause have probably occurred these are the only reports that I have been able to find in the literature. I believe that many of these eruptions are wrongly diagnosed and treated as dermatophytosis as was the case in both of my patients and that as Anderson and Ayres stated in 1931 it is still necessary to point out that not all eruptions of the feet are of fungous origin and that other factors must be considered. For these reasons I am reporting the following cases.

REPORT OF CASES

CASE 1—H. H., a man, aged 50, seen Jan. 11, 1937, had an extremely itchy eruption on both feet which had been present

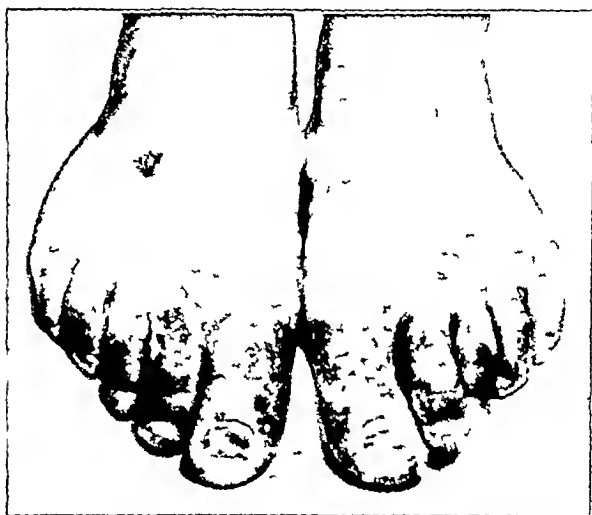


Fig. 1—Sharply outlined red scaly vesicular dermatitis of the dorsa of the toes, most marked on the first two toes of each foot.

for the past four months. He had been treated for fungous infection with wet dressings, lotions, various ointments and several ultraviolet ray treatments. The use of wet dressings at first had been followed by considerable improvement but since then the eruption had healed and recurred several times. At the time of his first visit the eruption was much better than it had been before and was limited to the toes except for faint remains of the previous eruption on the dorsa of the feet. The interspaces of the toes had never been affected.

Examination revealed erythema, scaling, slight edema and several excoriations and involuting vesicles on the dorsa of the toes (fig. 1). The eruption was most marked on the first two toes and became progressively less toward the last toes. There was some erythema and vesiculation on the plantar surface of some of the toes but the interspaces and soles were entirely

- 1 Bloch, Bruno. The Role of Idiosyncrasy and Allergy in Dermatology. *Arch. Dermat. & Syph.* 19: 175 (Feb.) 1929.
- 2 Lewis, G. M. Dermatitis Venenata Due to Shoe Leather. *Arch. Dermat. & Syph.* 24: 597 (Oct.) 1931.
- 3 Stauffer, Hans. Die Ekzempothese (Methodik und Ergebnisse). *Arch. f. Dermat. u. Syph.* 162: 517, 1931.
- 4 Grasreiner, H. Aetiologie des interdigitalen Ekzems. *Dermat. Wchnschr.* 92: 12 (Jan. 3) 1931.
- 5 Ayres, N. P., and Anderson, Samuel, Jr. Dermatitis Venenata Due to Shoe Leather. *J. A. M. A.* 99: 25 (Jul. 2) 1932.
- 6 Lanzenberg, P. Artificial Eruption of Feet Provoked by Dyed Shoe Leather. *Bull. Soc. franç. de dermat. et syph.* 30: 1464 (Dec.) 1932.
- 7 Simon, F. A., and Rackemann, F. M. Contact Eczema Due to Clothing. *J. A. M. A.* 102: 127 (Jan. 13) 1934.
- 8 Beerman, Herman. Factors Involved in Leather Dermatitis. *Arch. Dermat. & Syph.* 29: 671 (May) 1934.

clear. There was ill defined erythema and scaling on the site of the former eruption on the dorsa of the feet.

The eruption started about a month after the patient wore a new pair of tan shoes and black shoes and some new colored socks. The patient had discarded the tan shoes and since the eruption had appeared he had worn only white socks but he was still wearing the black shoes. Before the onset of the eruption he had used a talcum powder on his feet and since then a medicated powder and occasionally an alum powder. He had never had the shoes dyed and they had not been soaked in the rain or snow. His feet did not perspire excessively.

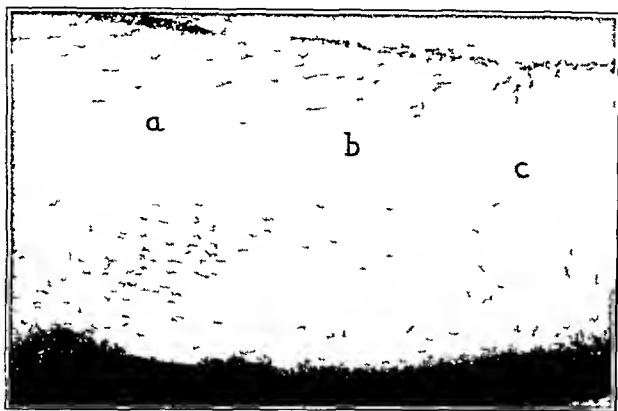


Fig 2—*a* and *b* marked red edematous vesiculobullous reaction to patch tests with shoe leather. *c* similar but milder reaction to patch test with contaminated sock.

Patch tests with the lining of both the right and the left black shoe, a piece of sock, two foot powders, ichthammol ointment, a liquid which he had used on his feet, and paraphenylenediamine were applied to the flexor surfaces of the forearms. The patches were removed forty-eight hours later. There was a marked erythematous, oozing, itchy, vesiculobullous reaction in both areas on which the shoe lining was applied and a similar although much less severe, reaction in the area covered with a piece of sock (fig 2). The latter was probably sufficiently contaminated with the shoe leather to give a weakly positive reaction. The other test areas were entirely negative. Patch tests with the same shoe lining applied to the skins of two controls produced no reaction. No fungi were demonstrable from the vesicles or scales on the toes. Treatment consisted of discarding this particular pair of shoes, the application of soothing ointments and five fractional doses of roentgen rays. On February 17 the eruption and itching had completely disappeared.

The patient was requested to return for observation and was seen again April 10. Although his new pair of shoes were black and were made by the same manufacturer, his feet had remained entirely free from eruption and itching since his last visit. He stated that since the eruption both great toe nails had been very thin, soft and brittle and had split into two or three layers at the tips and that the toes felt somewhat numb. Examination revealed slight thickening and pigmentation of the skin of the dorsum of each great toe and some thinning and splitting of the end of each great toe nail. The skin of the other toes, interspaces and soles was entirely normal and there was no hyperhidrosis.

CASE 2—T. D., a white youth, aged 19, first seen May 10, 1937, presented a sharply outlined, red, oozing, crusted, vesicular dermatitis on the dorsa of the toes of both feet. There was also some eruption on the plantar surfaces of the toes but the interspaces were entirely clear. The eruption was most marked on the dorsum of the left great toe and more severe on the left foot than on the right. On both feet it was present chiefly on the first three toes. The eruption had been present for seven months and appeared about a week after the patient had worn a new pair of black low shoes. When the shoes were first worn the patient had a hole in the toe of his left sock. The special severity of the eruption on the left great toe may have been caused by the direct contact of this area with the shoe leather. Microscopic examination and culture for fungi and the Wassermann reaction of the blood were negative. Patch tests with the

lining of the left shoe applied to the flexor surface of the left forearm and later to the dorsum of the left foot were both negative but the itching and eruption disappeared rapidly after the shoes were discarded and Lassus' paste was applied. Two weeks later the eruption had entirely disappeared. For several months before his first visit he had been treated with various soothing and fungicidal applications. These had caused no improvement and some produced aggravation of the eruption.

COMMENT

Shoe leather dermatitis may, as in these two cases, occur independent of any other factor except the patient's specific sensitivity, but frequently, as in the cases reported by Beerman,⁹ other factors such as fungous infection, dermatitis from some other cause, foci of infection and hyperhidrosis may play a precipitating or aggravating role. It is important to differentiate this apparently rather rare condition from the more or less ubiquitous fungous infections of the feet and to remember that merely because the latter are so common they are not necessarily the cause of all pedal dermatoses. As shown in the two cases, the salient features of shoe leather dermatitis compared with dermatophytosis of the feet are: 1. The appearance of the eruption shortly after wearing new or freshly dyed shoes and its disappearance after changing the shoes. 2. A positive patch test with the suspected shoe leather. 3. The failure to demonstrate fungi by microscopic examination or culture and the lack of effect or harmful action of fungicidal therapy. 4. The relatively greater itching, the severity of the itching is out of proportion to that of the eruption and may be present several days before the eruption appears. 5. The lack of involvement of the interspaces of the toes. 6. The sharply outlined border of the dermatitis. 7. The predilection for the great toes and the dorsa of the toes and feet instead of for the little toes and plantar surfaces and sides of the feet as in dermatophytosis (the eruption in shoe leather dermatitis is usually most marked on the dorsa of the great toes and becomes progressively less on the smaller toes and may be entirely absent on the little toes). 8. The involvement of the ankles when high shoes are worn. The first two are the most constant and diagnostic features but as in the second case, patch tests may be negative although the eruption complies with the other diagnostic criteria. Any one of these factors and most certainly two or three should make one dealing with a vesicular eruption of the feet strongly suspect shoe leather dermatitis rather than dermatophytosis.

Fortunately, these patients are usually sensitive to only one certain pair of shoes and not to shoe leather in general. My first patient wore a new pair of shoes of the same color and made by the same manufacturer without any ill effect. The British Leather Manufacturers Research Association¹⁰ has investigated cases of shoe leather dermatitis and has come to the conclusion that this is caused by the presence of either free chrome acid or excessive amounts of water soluble dyestuffs. An excess of either substance may be present in only one pair of shoes of an entire batch. As has been mentioned by Lewis and Beerman,¹¹ the manufacture of leather is a very complex process. I wrote to the manufacturer of the shoes worn by the first patient and he stated: "The materials that go into the making of a pair of shoes are so numerous that we find it is almost impossible to get the exact chemical content of each and every one of them so that I was unable to test the patient with the separate ingredients contained in the leather."

One must distinguish poisoning from shoe dye with general symptoms, as reported by Iruenberg,¹² Raimond¹³ and Harry,¹⁴ from dermatitis due to substances used in the tanning of shoe leather and from sock dermatitis¹⁵ as well as dermatophytosis. Both of my patients wore white socks and the eruption disappeared after their shoes were changed while they were wearing the same socks; therefore it was not due to the dye or to the finish in the socks. The positive patch test with the sock in the first case was undoubtedly due to contamination from the leather since the reaction was much weaker than with

9. Shoe Leather Dermatitis. London Letter J. A. M. A. 94: 119 (April 2), 1932.
10. Raimond, Louis. Dermatitis Provoked by Aniline Stains. *Proc. Acad. Med.* 39: 763 (May 23), 1931.
11. Harry, R. L. Report of Cases of Dermatitis Due to Shoe Leather. *Nebraska M. J.* 19: 4 (Dec.) 1934.
12. Schwartz, Louis. Actual Cause of Dermatitis Attributed to Shoe Leather. *Health Re.* 49: 1176 (Oct. 5), 1934.

the leather alone. Lanzenberg reported a case of dermatitis due to dyed shoe leather occurring a few days after wearing new shoes. This was accompanied by general symptoms of malaise and weakness which disappeared when the shoes were not worn. He scarified the patient's skin and performed a patch test with an aqueous solution of a piece of the leather. There was only a mild local reaction but the general symptoms recurred. Ramond's patient had a vesicular and bullous eruption on the feet with urticarial lesions on the body as well as symptoms of general poisoning, such as cyanosis, dizziness and nausea after wearing shoes treated with aniline dye. Harry reported four cases of poisoning due to absorption through the skin of solvents used in shoe dye. The symptoms were headache, dizziness, restlessness, paralysis, convulsions, trismus, vomiting, dyspnea, nausea, methemoglobinemia and marked bluish black discoloration of the skin, mucous membranes and nails. In contrast to the other reports none of his four patients showed any local dermatitis. The dye in shoe leather may cause both a dermatitis and general symptoms or either alone while the other ingredients rarely provoke more than a localized dermatitis.

SUMMARY

Two cases were observed of dermatitis due to shoe leather. Patch tests were strongly positive in one of these and negative in the other. In both cases the eruption appeared shortly after a certain pair of shoes were worn and disappeared soon after these were discarded. In neither case was there any predisposing factor such as fungous infection or hyperhidrosis. These two cases are reported to emphasize again the fact that a dermatitis of the feet may be due to causes other than fungous infection.

114 East Fifty-Fourth Street

ACUTE INTESTINAL OBSTRUCTION DUE TO
INGESTION OF ORANGES

JAMES C. OWINGS, M.D., BALTIMORE

Obstruction due to ingestion of food products with bulky residue is apparently rather uncommon since Elliot¹ in his review of the literature covering the period between 1910 and 1932 was able to find only thirty-nine cases. Obstruction due to the swallowing of improperly chewed oranges is naturally much more rare. I have been able to find in the literature of the past thirty-one years only three other cases like the one that I am reporting.

The first case was reported by Griffiths² in 1926 and was of a white man, aged 44, who had symptoms of very acute intestinal obstruction and died before operation could be performed. The total time between onset of symptoms and death was less than twenty-four hours. The terminal ileum was found to be obstructed by nearly half of a small orange with the rind intact. Part of the orange was impacted in a Meckel's diverticulum while the rest swung across the lumen of the ileum like a door. The second case was reported by Block³. A white woman, aged 57, was admitted to the hospital for operation June 27, 1932, with the history and signs of acute intestinal obstruction and of having eaten oranges twelve hours previously. At operation a boggy mass was found in the terminal ileum and removed through an enterostomy. The mass proved to be two segments of an orange impacted side by side. The patient had no teeth and had not been able to chew the orange properly. Bilateral pneumonia developed and she died on the tenth postoperative day. There was no peritonitis present. The third patient was a man, aged 36, reported by Elliot¹ to have eaten two dozen oranges forty-eight hours previously on an empty stomach after having ridden on a freight car for several days. He had commenced having severe abdominal pain within four hours and was very much nauseated but could not vomit. When he was first seen, distention was so great that breathing was very difficult. Before operation, 3,500 cc of foul fluid was removed from his stomach. Eighteen inches of the terminal

ileum was occupied by a doughy, movable mass, which was removed through two incisions. There was enough pulp and seed to fill two cupped hands. The patient died during the second postoperative day and an autopsy revealed a generalized peritonitis, in spite of the fact that the incision in the bowel was reported to be well sealed over and no perforations were found.

AUTHOR'S CASE

Mrs. E. K. White, German, aged 58, was admitted to the Church Home and Infirmary, May 12, 1937, with a complaint of severe intermittent abdominal pain associated with nausea and vomiting. Her family and past history were essentially noncontributory to the present complaint with the exceptions that she had had a midline ventral hernia for fifteen years and had been operated on for acute appendicitis with an uneventful convalescence during December 1936. She also had had several attacks of somewhat the same nature during the past few years, always associated with dietary indiscretion and followed by soreness at the site of the hernia and diarrhea. The present attack had started during the previous evening and had followed the rather rapid eating of an orange during the afternoon. However, her pain was not severe until the morning of the day of admission. She had one good bowel movement during the night but there had been none since. During the latter part of the day the pain had on two occasions been associated with nausea and vomiting. She had taken magnesium magma without effect except to increase the pain. I was called in to see her at about 8 p.m., approximately twenty-four hours after the onset of symptoms and twenty-eight hours after the ingestion of the orange. At this time she showed tenderness in the right lower quadrant but no muscle spasm and no distention. No definite mass could be felt. The ventral hernia ring was readily palpated and the sac could be filled and emptied at will. She was having severe cramp-like pains about every ten minutes, lasting about two minutes. The white blood count was 8,200, temperature 99.6 F, pulse 90, respiration 22 and blood pressure 165 systolic, 90 diastolic. The appendectomy scar was quite firm and there was no evidence of hernia at the usual hernial rings. Many bubbling and gurgling sounds could be heard in the lower part of the abdomen. The general physical examina-



Material removed from terminal ileum, Mrs. E. K.

tion was essentially negative. A diagnosis of acute intestinal obstruction probably due to a band of adhesions was made and immediate operation advised. At operation a right rectus incision was made in order that repair of the hernia might be done at the same time that the abdomen was explored. As soon as the peritoneum was opened a large amount of blood-stained free fluid was encountered. The cause of this was readily found to be a boggy mass filling about 4 inches of the terminal ileum and obstructing it at a point about 8 inches above the ileocecal valve. The bowel above the point of obstruction was slightly distended, edematous and reddened for as far up as could be seen. An attempt was made to break up the mass and force it through the ileocecal valve, but this was unsuccessful, so a small longitudinal incision was made in the antemesen-

¹ Elliot, A. H. Intestinal Obstruction Caused By Food. Review of the Literature and Case Report. *Am. J. Mt. Sc.* 184: 85-94 (July) 1912.
² Griffiths, W. R. An Unusual Case of Intestinal Obstruction. *Med. Australia* 2: 557 (Oct. 2) 1926.
³ Block, F. B. Intestinal Obstruction Caused by Food. *Am. J. Mt. Sc.* 185: 556 (March) 1913.

teric border of the collapsed bowel just distal to the point of obstruction and the mass expressed through it. It proved to be several almost intact segments of orange together with orange pulp and seeds. The wound in the bowel was then closed transversely by a continuous silk suture reinforced with mattress sutures of silk so as to increase rather than to narrow the lumen at this point. The hernia was then quickly repaired and the abdominal wound closed without drainage with chromic catgut. The patient made an uneventful recovery and was discharged from the hospital June 10, having been kept in bed longer than usual because of the rapid repair of the hernia. She has had no further trouble up to the present date.

This patient showed most of the signs exhibited by similar cases in Elliot's review, with two notable exceptions. She was a middle aged woman, edentulous, with a short interval between ingestion of the food and onset of symptoms, the site of obstruction was in the terminal ileum and there was failure of accurate diagnosis as to the cause of the obstruction. The two exceptions exhibited by my case were that distention did not occur quickly and death did not occur after operation. Two facts are probably responsible for this favorable outcome. First, the bowel was not much distended and the bowel wall not greatly damaged in spite of the fact that there had been at least partial obstruction for twenty-four hours. Secondly the obstructing mass was removed through an incision made in normal bowel wall rather than through one made directly over the point of obstruction.

18 West Franklin Street

TOTAL HEMIATROPHY

BENJAMIN FINESILVER M.D. AND HERMAN M. ROSOW M.D.
NEW YORK

In a survey of the literature, Archambault and Fromm¹ were able to cull 400 cases of progressive facial hemiatrophy up to the year 1932. Of this total there were about twenty-four instances of an associated atrophy involving one side of the body. Since that time a further search of the literature reveals approximately ten more cases of true unilateral atrophy not due to or associated with other diseases of the central nervous system. In a consideration of unilateral atrophy, the cases occurring in association with infantile cerebral hemiplegia must be definitely excluded. It is possible that such hemiatrophy may be due to disuse or, in the light of recent knowledge, to the effect of the higher nerve centers and their pathways on the nutritional influences of the tissues they supply. The cause of unilateral atrophy, beginning as it usually does with facial hemiatrophy, must be identical with the process that gives rise to the latter. The cause or causes are obscure, and those propounded by different investigators are at best speculative and conjectural. Hemiatrophies have been considered as part and parcel of a scleroderma, an endocrine dyscrasia, a trophoneurosis and owing to involvement of the peripendymal gray matter of the sylvian aqueduct and oval portion of the fourth ventricle, as the cause of the atrophy.

From the service of Dr. Stephen P. Jewett, Neurological Department, Metropolitan Hospital, Welfare Island.

1. Archambault, LaSalle and Fromm, A. K. *Progressive Facial Hemiatrophy*. Arch. Neurol. & Psychiat. 27: 529 (March) 1932.

2. Boardman, W. P. *Total Hemiatrophy with Scleroderma*. Arch. Dermat. & Syph. 15: 504 (April) 1927.

3. These references include:

Tobias, Norman. *Congenital Hemiatrophy Associated with Linear Nevus*. Arch. Pediat. 45: 673 (Nov.) 1928.

McCracklin, R. H. *Sclerodactylia with Hemiatrophy*. J. Pediat. 9: 173 (Aug.) 1936.

Masten, M. G. *Unilateral Atrophy and Facial Hypertrophy*. Arch. Neurol. & Psychiat. 35: 136 (Jan.) 1936.

Gritz, O. *Scleroderma Cutis Follicularis with Unilateral Atrophy of Face and Body*. Dermat. Ztschr. 52: 227 (April) 1928.

Peabody, C. W. *Hemihypertrophy and Hemiatrophy*. Congenital Total Unilateral Somatic Asymmetry. J. Bone & Joint Surg. 18: 466 (April) 1936.

Kampmeier, R. H. *Total Hemiatrophy and Cerebellar Tumor*. J. Nerv. & Ment. Dis. 84: 187 (Aug.) 1936.

Meyer, H. E. *Total Hemiatrophy*. Med. Klin. 32: 352 (March 13) 1936.

Conor, B. *Hemiatrophy of Trunk and Tongue Scleroderma Following Encephalitis*. Rev. neurol. 63: 285 (Feb.) 1933.

Mikolaj, D. and Doncz, M. *Hemiatrophy with Hemiparkinsonism*. Deutsche Ztschr. f. Nervenhe. 27: 194 1932.

Kraus, W. M. and Perkin, O. C. *Somatic and Visceral Atrophy with Review of Reported Cases of Unilateral Atrophy*. Arch. Neurol. & Psychiat. 18: 249 (Aug.) 1927.

Brid and Maladie nerveuse. Paris. Ma on & Cie. 2: 376 1899.

Archambault and Fromm¹ are of the opinion that sympathetic implication is the only underlying cause of facial hemiatrophy which may be due to injury or to compression of the sympathetic system, and antecedent infections may possibly play a role in the production of hemiatrophy. The case reported here is an authentic one of unilateral atrophy independent of any other disease of the central nervous system. It conforms with the classic description of other reported cases of total hemiatrophy.

REPORT OF CASE

History—D. G., a white woman aged 23 single, born in the United States, admitted to the Metropolitan Hospital Jan. 28, 1937, complained only of a diminution in the size of the left half of the body.

The history dates back to the age of 7 years. Information obtained from the father reveals that prior to that time the patient was apparently normal and presented no features of the existing present condition. At that time her parents noted a brownish discoloration of the left breast and of the left side



Fig. 1—Difference in the sides of the face

of the face. Shortly afterward they noted that the left half of the body and face had diminished in volume, this relative diminution continued until, in two or three years, it had reached the degree that the patient now presents and has remained stationary since. Her father states that the left side shrunk and appeared not to be growing as fast as the right side, shortening her stature on the left.

The patient was born spontaneously at full term, her mother was in labor only seven hours. The birth weight was 8 pounds 4 ounces (3742 Gm.). Childhood was uneventful. In 1933 the patient fell down a flight of stairs, injuring her head and left thigh; this resulted in an osteomyelitis of the left femur. There was no history of any gastro-intestinal, cardio-respiratory or genito-urinary disturbances. The menses began at the age of 14, have been regular (twenty-eight day cycle lasting from three to four days) and have not been associated with any dysmenorrhea. Otherwise the history is entirely negative.

There is no history of a similar ailment in her family or in the families of her father and mother. There was no history of consanguinity. The father is living at the age of 67. The mother died of leakage of the heart at the age of 41. The patient has two older sisters and one older brother, all of whom are younger sisters and two younger brothers all normal.

Physical Examination—On physical examination the patient was up and about, mentally alert, cooperative and with no complaints. Despite her physical deformity, which is extremely

apparent since one side of her face is entirely different from the other she is well adjusted and entirely free from feelings of inferiority. This absence of feeling of inferiority is not due to the presence of a euphoric condition. She is intelligent a dressmaker, and has been able to command a good salary when work has been available.

The patient walks with a slight limp owing to a shortening of the left lower extremity.

TABLE 1—Measurements of the Body

	Right Cm	Left Cm
Root of nose to external auditory meatus	14	11.5
Midline to angle of mandible	11	9
Wrists	14.5	13.5
Forearms	21.5	18.5
Arms	24	19.5
Thighs	33	25
Calves	14	2.8
Ankles	21.5	16.5
Chest	41.2	35
Abdomen	50	21

TABLE 2—Galvanic Stimulation of Muscles

Area Stimulated	Milliamperes of Current Necessary to Produce Contraction	
	Right	Left
Infralabial	3.5	6.0
Masseter	4.0	6.0
Frontalis	4.0	6.0
Clitoral	3.5	6.0

In each case the anodal closure contraction > cathodal closure contraction > cathodal opening contraction

TABLE 3—Gastric Analysis

	Specimens				
	1	2	3	4	5
Total acids	25	5	5	0	0
Free hydrochloric acid	5	0	0	0	0
Combined hydrochloric acid	20	5	5	4	3
Lactic acid	Neg	Neg	Neg	Neg	Neg

The left side of the face presents a shrunken atrophic wizened appearance. The left eye is sunken deeply into the orbit, this appears to be due to the absence of periorbital fat and gives the eye the appearance of being freely suspended in the orbital fossa. There is a slight lagophthalmos on the left and contraction of the conjunctival sac, with the obliteration of all fornices. All extra-ocular movements are impaired but chiefly involved are the superior oblique the inferior rectus and the external rectus. There is atrophy of the nasal half of the upper margin of the lid.

The left side of the mouth is drawn upward, this is undoubtedly due to the marked atrophy of both the skin and the subcutaneous tissues of the left side of the face. The skin of the left side of the face is shiny, tense and adherent with a brownish discoloration of a blotchy character. This condition ends at exactly the midline, the right side of the face being entirely normal.

The tongue deviates markedly to the left its volume is somewhat less on that side. No fibrillations of the tongue were noted.

The jaw deviates to the left and the masseter and temporal muscles on that side are markedly atrophied. The left sternocleidomastoid muscles appear to be spared.

The left pectoral group of muscles are markedly diminished in comparison with those on the right. The left breast is about half the volume of the right. All the muscles on the left side of the body are smaller than the corresponding ones on the right.

The left buttock is about one-third the size of the right and the left lower extremity is about one-half the volume of the right.

The measurements of corresponding parts of the body are given in table 1.

The skin on the left side of the body is tense, shiny and pigmented having the appearance of a scleroderma. Biopsy of the skin confirmed this impression.

The right side of the body has normal hair distribution the left half is almost devoid of hair except on the scalp, where the hair is equally abundant.

There are exostoses and irregularities of the calvarium limited to the left side. The left tonsil is markedly atrophied as compared with the right. A few enlarged cervical glands are present on the right.

The heart is not enlarged. The heart sounds are of good quality, no murmurs were audible. The lungs are resonant throughout with normal vesicular breath sounds. The blood pressure on the right arm was 106 systolic, 70 diastolic, on the left arm 108 systolic, 66 diastolic. The pulse rate was equal on the right and the left side.

There is a marked wasting of the skin and underlying tissues on the left side of the abdomen. No rigidities masses or localized tendernesses were present. The kidneys liver and spleen were not palpable.

The genitalia are normal except for atrophy of the labia on the left. There is good sphincteric tone of the rectum.

Special Tests—Oculocardiac Reflex. The pulse rate was 98 bilaterally. Pressure on the right eye resulted in the pulse rate slowing to 68. Pressure on the left eye resulted in the pulse rate slowing to 56.

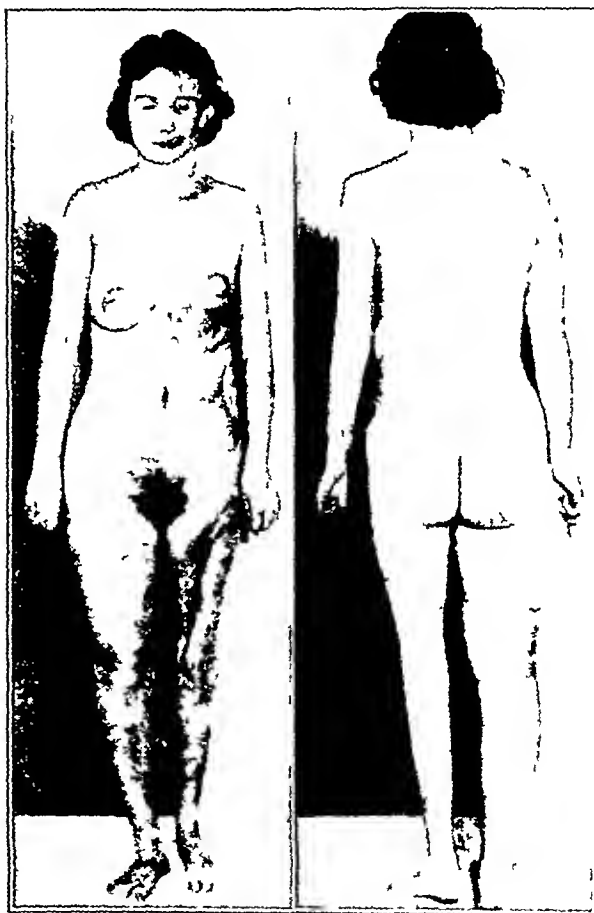


Fig. 2—Front and rear views showing atrophy limited to one side of the body.

Circulation Time—An injection of 25 Gm of saccharin dissolved in 25 cc of sterile distilled water was made into the left median vein and the interval between injecting and testing was noted. After an interval of about fifteen minutes the procedure was repeated on the right side. The time on the left was 21.6 seconds on the right 21.3 seconds. The patient stated that the sweet taste persisted for thirty seconds on the

left whereas the sweet taste disappeared in a few seconds after it was tasted following injection on the right

Galvanic stimulation of muscles is recorded in table 2

Skin Temperatures Skin temperatures on corresponding halves of the body were found to be equal

Pilocarpine Injection Following the injection (subcutaneous) of one eighth gram (0.008 Gm.) of pilocarpine sweating on the right half of the body was more profuse than on the left. However the left pupil dilated more than the right

Basal metabolism The rate was -2 per cent repeated +13 per cent

Intravenous Pyelography The pelves and calices of both kidneys are normal in size, shape and position

Electrocardiogram There was a regular sinus rhythm

Urine Concentration Test The patient is able to concentrate from 1004 to 1024

Laboratory Examinations—Urinalysis The urine was clear and yellow, it was negative for sugar and albumin specific gravity was 1.010 no casts, a few white blood cells and a few epithelial cells were found. Repeated creatine creatinine ratios were as follows creatine 0.97 0.94 and 0.89 creatinine 0.24 0.21 and 0.23



Fig. 3—Atrophic side of face lateral view

Blood Chemistry Examination revealed sugar 85, urea nitrogen 10, creatine 15, cholesterol 220 mg. per hundred cubic centimeters of blood

Dextrose Tolerance Test Blood sugars taken a half hour, an hour, two hours and three hours following administration of dextrose were 92 mg, 115 mg, 145 mg, 137 mg

The Wassermann reaction of the blood was negative

Spinal Fluid A spinal tap was performed while the patient was in the sitting posture. The initial pressure was 25 mm. of mercury. The Queckenstedt reaction was positive on both the right and left sides. The 10 cc. of spinal fluid removed was clear and colorless. The final pressure was 15 mm. of mercury. Globulin was not increased, sugar was 58 mg. there were three lymphocytes per cubic millimeter, the colloidal gold curve was normal.

The gastric analysis is given in table 3

Biopsy of the skin taken from the abdomen showed hyper trophy of the collagenous tissue. The papillae were wiped out entirely. The basal layer of the rete malpighi showed edema. The vessels were less numerous and were surrounded by a mantle of lymphocytes. The diagnosis was scleroderma.

The fingerprints of both hands show normal configuration

X-Ray Examination—Chest Both apices were clear. The hilar markings were moderately thickened. Several glands were

present. Both pulmonary fields including the costophrenic sinuses were otherwise clear. The cardiac shadow was normal.

Long Bones There was no bone involvement except that bones on the left were somewhat shorter than homologous bones on the right.

Skull The sella turcica was moderate in size, the anterior and posterior clinoid processes were closely approximated but within normal limits. The calcified pineal was normal in location. Otherwise the skull was normal. Encephalography was refused.

Lumbar Region and Pelvis There was scoliosis of the lumbar spine, otherwise the lumbar region and pelvis were normal.

COMMENT

The unilateral atrophy, the scleroderma, the differences in sweating reactions on the atrophic side of the body and the sparsity of hairy distribution on the involved side in this case are some factors that may favor a suggestion of sympathetic involvement. This contention may be refuted or ardently supported. We have no concrete evidence to support this belief but can merely speculate as to its plausibility. It is possible that in cases of unilateral atrophy there may be an involvement of the central sympathetic fibers within the cervical and lower segments of the cord or even involvement of the higher centers in the brain. It is well known that facial hemiatrophy and unilateral atrophy may be associated with syringomyelia, syringobulbia, multiple sclerosis, porencephaly and other pathologic states that involve similar areas in the central nervous system. It is possible to infer that the sympathetic fibers may be centrally implicated and thus explain the occurrence of a total hemiatrophy.

Until further and repeated observations are made clinically, pharmacologically and pathologically, the question as to the exact nature of both facial and total hemiatrophy will continue to be an abstract and moot one. It is for this reason that another case is added to the interesting, rare and instructive cases thus far reported with the hope that continued study may shed some further light on this ambiguous entity.

241 Central Park West

FATAL GRANULOCYTOPENIA FROM SULFANILAMIDE

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AND SIMON KOLFTSKY, M.D., CLEVELAND

The extent to which sulfanilamide is now being used renders reports of even individual cases of untoward effects important and timely. Three cases of death from granulocytopenia following administration of sulfanilamide¹ and prontosil flavum² respectively have hitherto appeared. This publication adds a fourth case. Other toxic effects are apparently more frequent. Cases of sulfhemoglobinemia, methemoglobinemia, cyanosis, acidosis, anemia, depressed liver function, fever, mental confusion, toxic optic neuritis, nephritis and dermatitis have been reported.

REPORT OF CASE

W. S., a white man aged 32, American, entered the Cleveland City Hospital July 24, 1937, because of a penile ulcer. The patient had been under treatment for several years at the Lakeside Hospital Dermatology Clinic. The records show that in May, 1932, he had a seronegative primary syphilis. From May, 1932, to September, 1935, with eight months of assigned rest periods, the patient received forty injections of neoarsphenamine, sixty of bismuth salicylate and eleven of mercuric salicylate in customary dosages and with no signs of intolerance. The penile lesion healed rapidly. The patient felt well and the Kline test for syphilis remained negative throughout the period of treatment.

The patient was readmitted to the Lakeside Hospital Dermatology Clinic Jan. 15, 1937, because of a penile lesion at

From the Departments of Dermatology and Syphilology, Medicine and Pathology of Cleveland City Hospital and Western Reserve University School of Medicine.

1. Young, C. J.: Agranulocytosis and Para-Amino-Benzene Sulfonamide Brit. M. J. 2, 105, 106 (July 17, 1937).
2. Jorst, J. G.: Death from Agranulocytosis After Treatment with Prontosil Flavum. Lancet 1, 1519, 1520 (June 26, 1937).

another site. General physical examination gave essentially negative results. Darkfield examination of material taken from the penile ulcer showed *Spirochaeta pallida*. The Wassermann reaction was negative and the Kline reaction was four plus. The patient was considered to have a reinfection of syphilis and not a monorecapse. He was again started on treatment and received thirty-two injections of mapharsen (0.06 Gm), twelve of bismuth salicylate (0.026 Gm) and six of solution colloidal mercuric sulfide (3 cc) with no signs of intolerance. The last injection of mapharsen was given June 21, of bismuth July 1 and of mercury July 23. During this period of treatment the penile ulcer initially improved but later became secondarily infected and failed to heal satisfactorily.

The patient was admitted to the Cleveland City Hospital July 24 for further study and treatment. General physical examination again gave essentially negative results, the patient being robust, muscular and in excellent health except for the penile ulcer. This lesion was oval and sharply demarcated, with a purulent base. It measured 15 by 25 cm in diameter and 0.5 cm in depth. The leukocytes numbered 8,000 per cubic millimeter of blood. Smear study of the blood was not done. The Kline reaction on three occasions was four plus. A darkfield examination of material from the penile ulcer failed to show *Spirochaeta pallida* or Vincent's organisms and a stained smear showed a variety of bacteria but no Donovan bodies. A chronic chancroidal infection was suspected but could not be proved.

It was decided to test the therapeutic effect of sulfanilamide since some promise of benefit has been observed by the use of this drug in previous cases of chancroidal infection at this clinic. The oral administration of the drug was started July 26, the dosage being 5 Gm daily for two days, 375 Gm daily for the next three days and 2 Gm daily for the next thirteen days, i.e., until August 16.

August 13, by which time the patient had received a total dosage of 486 Gm of sulfanilamide, a routine test of the blood showed the leukocytes to number 3,900 and the erythrocytes 4,140,000 per cubic millimeter. August 16 the leukocytes numbered 2,000 and the erythrocytes 3,410,000, differential study showed the leukocytes to be 100 per cent lymphocytes. At this time the patient still felt well but owing to the leukopenia the administration of sulfanilamide was stopped. A total of 566 Gm had been given during a period of twenty-one days.

In an effort to stimulate the development of leukocytes, on August 17 a single intravenous injection of 20,000,000 killed typhoid bacilli was given. Following the injection the temperature, which previously had been normal, rose to 40.5 C (104.9 F). During the next three days the high fever persisted and the patient became increasingly ill. The leukocyte count dropped to 800 per cubic millimeter of blood, and no granulocytes were observed on smear study. Pentnucleotide (10 cc twice a day), intramuscular liver (5 cc twice a day) and a blood transfusion of 500 cc of whole blood were given without effect.

August 20 the patient for the first time complained of a sore throat and difficulty in swallowing. Examination showed slight necrotic ulceration of the mucous membrane in the tonsillar region. The sclerae were slightly icteric and the liver edge was palpable 3 cm below the costal margin. The patient became restless, confused, irrational and increasingly toxic and died the next day, August 21.³

The diagnosis was (1) agranulocytic angina due to sulfanilamide, (2) secondary anemia due to sulfanilamide, (3) syphilis, treated, (4) phagedenic ulcer of the penis.

AUTOPSY

Postmortem examination was performed six hours after death. The sclerae were moderately icteric. No lymphadenopathy was noted in any region of the body. The skin

3 The only medications not previously mentioned which the patient received before the development of granulocytopenia were as follows: elixir of cascara sagrada N. F. 16 cc July 28 bismuth salicylate in oil 0.13 Gm intramuscularly August 6 and 13 Hinkle's tablets (containing calcium podophyllum extract of belladonna, strychnine sulfate and oleoresin of ginger) two tablets August 13 saline soaks potassium permanganate soaks and iodoform powder applied to the penile lesion July 25 hot potassium permanganate soaks to the penile lesion from August 10 to August 16 and artificial gastric juice to the penile lesion from August 13 to August 16.

was normal except for a penile lesion. In the coronal sulcus was an ulcer 2.5 cm in diameter, which showed irregular edges with no undermining and an uneven, firm, dirty grayish green base. Microscopic examination of this lesion showed a fibrotic base with marked infiltration of lymphocytes and a striking absence of polymorphonuclears. There were superficial deposits of granular clumps of bacteria.

There was severe edema of the entire larynx and the epiglottis. The mucosal surfaces of these structures showed a grayish green discoloration but there was no purulent membrane or gross evidence of ulceration. The base of the tongue and peritonsillar pharyngeal areas presented a similar appearance. The tonsils were large, prominent and cryptic, and their surfaces were superficially ulcerated and covered by a thin grayish green exudate. Microscopic studies of the larynx showed hyperemia and edema of the mucosa and submucosa with extensive necrosis and lymphocytic infiltration. The tissues showed considerable loss of staining quality. Sections of the tonsils revealed a superficial necrotizing reaction involving the epithelium and underlying lymphoid tissue. In one area the process extended deeply into the adjacent muscle, with slight infiltration of lymphocytes.

The heart weighed 350 Gm and showed no significant gross or microscopic change. The lungs were hyperemic and edematous. Within the lumens of the trachea and the main and secondary bronchi there was considerable thin frothy blood-tinged fluid. In both lower lobes there were small focal grayish red areas of consolidation, which on microscopic examination were seen to be due to extravasation of edema fluid and red blood cells into the alveolar spaces. Occasional lymphocytes were found but there was a complete absence of polymorphonuclear cells.

The liver weighed 1,750 Gm. The cut surface showed slight bulging and a moderately hyperemic reddish brown parenchyma. Microscopically, the sinusoids and central veins were moderately dilated. The liver cells presented a pale cytoplasm which was distinctly granular and vacuolated. Throughout the sections the Kupffer cells were very prominent and showed large amounts of yellowish brown pigment, which was demonstrated to contain iron by special stain.

The spleen weighed 225 Gm. On section the parenchyma was brownish red, hyperemic and firm. The malpighian corpuscles were visible and fairly numerous but not especially prominent. Microscopic examination showed considerable hyperemia of the pulp sinuses. The lining endothelial cells were prominent and contained large quantities of iron bearing pigment.

The kidneys, adrenals, pancreas, gastro-intestinal tract, pelvic organs and brain showed no significant change.

The marrow of the sternum and vertebrae presented the usual orange-red trabeculated tissue. The right humerus and femur throughout their entire length showed a friable, grayish red marrow with only a moderate amount of fat interspersed. Sections from the sternum, right femur, right humerus and a vertebra were stained by the hematoxylin and eosin, Wright's and the azur-eosin methods. The cellularity of the hemopoietic tissue was within normal limits, with no obvious hyperplasia or hypoplasia. The differential count revealed 55 per cent myeloblasts, 35 per cent lymphocytes with an occasional plasma cell and 15 per cent nucleated red blood cells. The myeloblast was a large stem cell with a vesicular nucleus the chromatin of which was arranged in fine strands. The nucleolus was prominent. The cytoplasm stained a homogeneous pale blue and showed no granule formation. No degenerative changes were noted in these cells. The distinctive feature of the sections was the complete absence of adult polymorphonuclears and even of myelocytes. Thus the picture was one of reversion of the myeloid series to a stem cell type. Most of the red cells were late normoblasts, with an occasional erythroblast and a moderate number of degenerate forms. Megakaryocytes were fairly numerous in all the preparations. There were many large phagocytic cells containing much iron pigment.

COMMENT

All the factors concerned in the pathogenesis of granulocytopenia are not definitely known. Various toxic agents have been assigned an important etiologic role. In this case it is

believed that sulfanilamide is the only drug that can be directly incriminated. The patient was in good general health prior to receiving sulfanilamide and then, coincident with the intensive administration of this drug, granulocytopenia developed abruptly. Furthermore, sulfanilamide contains the leukotoxic benzene ring with an attached amino group. All the other drugs and medications administered were carefully considered in relation to the clinical sequence of events and ruled out as causative agents. The last dose of neosarsphenamine had been given three years previously to the onset of the disease. Mapharsen was last given fifty-six days before the development of the leukopenia. Furthermore, this drug is relatively innocuous and never has been reported as a cause of granulocytopenia. The heavy metals bismuth and mercury had been given intermittently for more than five years without any signs of intolerance.

The pathologic changes in this case are of considerable interest. The myeloid series of the marrow showed maturation arrest with stem cell hyperplasia and absence of more mature cells. Similar changes have been reported previously in fatal cases of granulocytopenia due to other causes. In addition, there was considerable reduction in the number of the nucleated red blood cells, and many degenerate forms. These changes in the erythrocytic series are consistent with the secondary anemia in the peripheral blood. The marked phagocytosis of iron in the liver, spleen and bone marrow indicates that the patient's rapidly developing anemia was of a hemolytic nature. From these observations it may be concluded that sulfanilamide in this case exerted a toxic effect on both the red and the white blood cell series.

It is to be emphasized that sulfanilamide is a drug with a multiplicity of serious toxic properties, particularly with reference to the hemopoietic system. Therefore, the drug should be administered only under careful observation and with frequent investigations of the blood.

FATAL GRANULOCYTOPENIA FOLLOWING SULFANILAMIDE THERAPY

SAMUEL BERG, M.D., NEWARK, N. J., AND MICHAEL HOLTZMAN, M.D.,
ELIZABETH, N. J.

Sulfanilamide has shown remarkable results in controlling many gonorrheal and streptococcal infections. Past experience with drugs synthesized on a benzene base prompted predictions of toxic manifestations involving the hemopoietic tissues, and this theoretical prognosis has been borne out in practice. Unfortunately, the most beneficial effects of sulfanilamide have been observed in patients who showed some toxic reaction to the drug, fortunately, most of the reactions, despite their severity, have not caused death.

Fatal reactions to the drug have been reported, but only twice before as a result of granulocytopenia. The first case, reported by Borst,¹ concerned a woman, aged 61, who had been treated for bleeding from the gums and vagina twelve and eleven years before the fatal illness. The diagnosis was thrombocytopenic purpura. Three years later petechiae appeared on the legs, the accompanying blood picture was essentially normal, including a slightly increased platelet count. The last illness, pyelocystitis, was treated with sulfanilamide. The white cell picture on two occasions during treatment was not extraordinary, but on the last two days the total leukocytes dropped to about 1,000 and the polymorphonuclears to 1 per cent. One day before death the throat was slightly red but this condition cleared up on the day of death and no evidences of angina were demonstrable at autopsy. Death occurred on the fortieth day of sulfanilamide therapy, and after a total dosage of 40 Gm.

The second case, reported by Young² occurred in a man aged 53, who was treated for acute rheumatic fever (fourth attack since 1901) with salicylates and then with sulfanilamide, the total amount of the latter drug being 54 Gm. Other drugs administered during this last illness were soluble barbitals

barbital and chloral. Death resulted from granulocytopenia four days after discontinuation of sulfanilamide. Bone marrow examination showed complete absence of all granular cells. Blood examination five days before death failed to reveal the impending granulocytopenic state.

The present case of fatal granulocytopenia following sulfanilamide medication occurred in a youth aged 22 years who was well developed and nourished and whose only previous illness of note was an attack of mild chorea at the age of 12, at which time a faint murmur was heard according to the history.

Blood Examinations

	9/19 (9 a m)	9/19 (4 p m)	9/20 (9 a m)
Hemoglobin	70%	70%	60%
Red blood corpuscles	4 600 000	4 640 000	3 000 000
Polychromasia	Slight	Slight	Slight
Stippling	Few	Few	Few
White blood corpuscles	1 800	1 800	1 600
Polymorphonuclears	1%	1%	0%
Lymphocytes	91%	99%	100%
Mononuclears	2%	0%	0%

Since then the patient had been examined on several occasions by insurance and industrial physicians with no comment as to cardiac disease. For several months he had been employed in an automobile assembly plant as checker in a supply service and, since various chemicals passed through this department, the nature of the case necessitates their listing even though we do not believe they had any etiologic relationship to the fatal disease. They were carbon tetrachloride, soap, pyroxylin base, gasoline, hydrochloric acid, phosphoric acid, rubber cement, caustic soda and wood pitch. Aug. 21, 1937, he contracted acute gonorrhea, for which sulfanilamide was prescribed two 5 grain (0.3 Gm.) tablets every four hours. After the fifth day they were discontinued because of slight fever, cramps, gaseous eructations and nausea, evidently a toxic reaction seen rather frequently. After an interval of four days the tablets were again taken, one after meals. Seven days later they were discontinued a second time because of fever, weakness and anorexia, undoubtedly another manifestation of sulfanilamide toxicity. A preparation containing alkalis and acetylsalicylic acid was prescribed. The urethral discharge reappeared but was limited to the anterior urethra according to symptoms and the two glass test, and, despite the evidences of toxicity from the drug, it was again administered in doses of two tablets three times a day. Eleven days later, after the total ingestion of 38 Gm., the patient experienced a chill, had a fever of 102 F., became nauseated and vomited, later in the day the vomiting became continuous and uncontrollable, fever rose to 104 F. and abdominal pain appeared. He was admitted to Alexian Brothers Hospital that evening in prostration.

Physical examination showed the following. The nasal and pharyngeal membranes were slightly injected. The tongue was dry and coated. The conjunctivae were pale, the sclerae were clear and there was no jaundice. Cyanosis was not noted. The blood pressure was 120 systolic, 75 diastolic. The cervical nodes were not enlarged. The abdomen was soft. The reflexes were normal. The patient was given gastric lavage, high colonic irrigations with sodium bicarbonate, morphine sulfate hypodermically, and 5 per cent dextrose in saline solution by hypodermoclysis.

Next morning blood examination revealed a marked leukopenia with practically no polymorphonuclears. At this time a faint diastolic blowing murmur at the aortic area was heard and the diastolic pressure dropped to 50. The heart was not enlarged, but with a rate of 130 and a temperature of 107 F. there was some question as to whether the murmur was functional or organic (chorea), and as to whether a bacterial (gonorrheal) endocarditis was to be considered. But much more portentous was the thick speck of an edematous larynx and the peculiar putrid odor of angina although necrotic changes were not visible. Liver extract and pentnucleotide were injected.

On the third day of hospitalization the entire fauces and pharynx showed extensive necrosis without enlargement of the regional lymph nodes. Edema of the larynx became more pronounced, breathing was stertorous, and the patient died after a short period of violent delirium. Autopsy was not performed.

¹ Borst, J. G. G. Death from Agranulocytosis After Treatment with Frontoil Flayum. *Lancet* 1: 1519-1520 (June 26) 1937.
² Young, C. J. Agranulocytosis and Para Aminobenzene Sulfonamide. *Brit. M. J.* 2: 105 (July 17) 1935.

The temperature varied between 104 and 107 F, the pulse between 120 and 140, and respirations between 20 and 40

Throat smears and cultures were negative for spirilla, fusiform bacilli and *Bacillus diphtheriae*. Blood culture was negative in broth and showed several colonies of *Staphylococcus albus* on the plate, undoubtedly a contaminant. The urine contained a trace of albumin but otherwise was normal.

Other types of toxic reactions to sulfanilamide involving the blood, such as acute hemolytic anemia,³ sulfhemoglobinemia⁴ and leukopenia,⁵ have shown improvement on discontinuation of the drug. Granulocytopenia, however, might make its appearance even after cessation of therapy, as it did four days after in Young's case. In other respects, nothing can be added to what is already known about granulocytopenia following other benzene products. If there is any question as to whether sulfanilamide can induce the granulocytopenic state this third reported fatal case adds its weight to the belief that the relationship is actually causal.

156 Roseville Avenue—167 Second Street

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT
HOWARD A. CARTER, Secretary

ROSE CX-2 RADIATHERMY UNIT (WITH VARIOUS WAVELENGTHS) ACCEPTABLE

Manufacturer The E. J. Rose Manufacturing Company, Los Angeles

The Rose CX-2 Radiathermy Unit is designed for medical and surgical use. It has four terminal outlets permitting the use of four nominal frequencies, 16, 12, 9 and 6 meters. The various types of electrodes available with this unit are the conventional cuffs, inductance coil and electro-surgical attachments for coagulating and cutting currents. The model is portable but can also be used in a cabinet. Its shipping weight is about 80 pounds. It comprises a series feed push pull modified Hartley oscillating circuit and a patent circuit inductively coupled to the oscillator, with a variable condenser incorporated in the circuit for tuning purposes.

The input power required to operate this unit at full load is about 1,180 watts. Since no acceptable means has been devised for measuring radiothermic output wattage, no claims for such are made. Burns may be produced but can be avoided by ordinary precautions.

Transformer temperature rise came within Council limitations.

The Rose Company submitted seven series of physiologic tests on this unit performed by a reliable investigator. An inductance coil was used in tests made at 16, 12 and 9 meters. Tests were run with the cuff electrodes at the same wavelengths and also at 6 meters.

Eight healthy male medical students were used for these tests. The left thigh was used for the first observation. Thereafter the experiments were conducted on the left and right thigh alternately. Each patient was given two treatments in a day, the first being on the right leg in the morning and the second being made on the left leg in the afternoon. Temperature measurements were made with a thermocouple in the anterior portion of the thigh at depths of one eighth inch, three fourths inch and 2 inches or on the bone. These depths

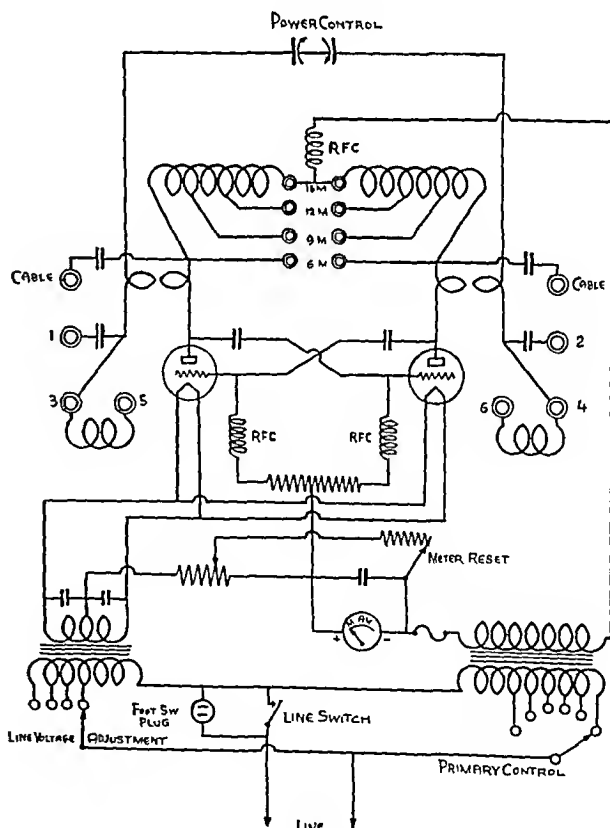
were measured from the skin straight in, that is, normal to the skin surface. In applying the inductive coil, one inch of bath towel was wrapped round the thigh and it was held in place by about four wraps of inductance cable. The averages of seven tests are given. Each average was made for eight observations at a given wavelength and with a given technique.

Averages of Seven Tests

Application		Average Temperatures			
		Skin	Subcutaneous	Muscle	Oral
Application 1	16 meters with cable				
	Before	95.4	98.6	99.9	98.4
	After	101.5	103.0	102.8	99.1
Application 2	12 meters with cable				
	Before	92.2	97.4	99.1	98.2
	After	101.6	104.8	104.2	98.7
Application 3	9 meters with cable				
	Before	92.7	98.5	99.2	98.4
	After	101.4	105.4	104.1	99.1
Application 4	16 meters with cuffs				
	Before	91.5	98.4	99.2	98.3
	After	100.7	104.3	104.0	98.7
Application 5	12 meters with cuffs				
	Before	93.1	97.7	99.3	98.0
	After	100.6	103.5	103.1	98.4
Application 6	9 meters with cuffs				
	Before	92.6	97.8	99.7	98.2
	After	101.0	104.0	103.2	98.8
Application 7	6 meters with cuffs				
	Before	93.4	99.4	99.9	98.7
	After	102.1	104.8	103.5	99.2



Rose CX-2
Radiathermy



Schematic diagram of circuit

This unit was tested in a clinic acceptable to the Council and found to be satisfactory. Sufficient heat is available at the different wavelengths to justify the recommendation that this unit be accepted by the Council.

In view of the foregoing report, the Council on Physical Therapy voted to include the Rose CX-2 Radiathermy Unit in its list of accepted devices.

³ Harvey A. M. and Janeway C. A. The Development of Acute Hemolytic Anemia During the Administration of Sulfanilamide. *J. A. M. A.* 109:1216 (July 3) 1937.

⁴ Discombe George. Sulfhemoglobinemia Following Sulfanilamide Treatment. *Lancet* 1:626-627 (March 13) 1937.

⁵ Trumper Abraham. Prontylin and Prontosil. *New England J. Med.* 216:857 (May 13) 1937.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JANUARY 29, 1938

SULFANILAMIDE AND THE LEUKOCYTES

Innumerable reports now testify to the effectiveness of sulfanilamide in the treatment of infections with the beta hemolytic streptococcus and with other organisms. Many published reports also indicate that toxic reactions frequently follow the therapeutic use of sulfanilamide. In a single issue of THE JOURNAL, published a few months ago, eleven different reports called attention to the efficiency of the drug and to toxic reactions that followed its use, including optic neuritis, purpuric and scarlatiniform eruptions, dermatitis, acute hemolytic anemia, and a peculiar eruption induced by sulfanilamide and sunlight. Now, in this issue of THE JOURNAL, additional papers call further attention to the effects of sulfanilamide. On page 368, Schwartz, Garvin and Koletsky report a fatal case of granulocytopenia which followed the use of sulfanilamide in the treatment of a chronic penile ulcer. This patient received 5 Gm of sulfanilamide daily for two days, then 2 Gm daily until he had taken a total of 48.6 Gm. A routine blood count showed the leukocytes to number 3,900 and three days later to be 2,000 with no neutrophils. The sulfanilamide was stopped after the patient had received a total of 56.6 Gm in twenty-one days. Four days later, examination showed slight necrotic ulceration in the tonsillar region. He was now slightly icteric and the liver could be felt below the costal margin. The patient died the next day. The authors believe that sulfanilamide is the only drug that can be directly incriminated in this case. At necropsy the myeloid series of the marrow showed maturation arrest with stem cell hyperplasia and absence of the more mature cells.

Another fatal case of granulocytopenia which followed the use of sulfanilamide is reported on page 370 by Berg and Holtzman. The patient, a man, aged 22, previously had been in excellent health. Although he had been employed in an automobile assembly plant, through which various chemicals passed, these were not believed to have had any relation to his illness. This patient was given 5 grains (0.3 Gm) of sulfanilamide

every four hours for the treatment of acute gonorrhea. On the fifth day of the treatment he had slight fever, cramps and nausea and the sulfanilamide was discontinued, to be given again in much smaller doses four days later. The foregoing symptoms recurred after seven days and the drug was again discontinued. Several days later, after a total ingestion of 38 Gm. of sulfanilamide, the patient had a chill, fever, uncontrollable vomiting and abdominal pain. A blood count showed practically no polymorphonuclear cells. His diastolic blood pressure had dropped to 50. His pulse rate had risen to 130 and his temperature to 107°. As in the previous fatal case, pentnucleotide and other things were given to stimulate the development of leukocytes, but the patient died after a short period of violent delirium. Necropsy was not performed. The authors likewise believe that sulfanilamide was actually causal in inducing granulocytopenia in this patient.

On page 343 of this issue is a clinical study of the effects of sulfanilamide on the leukocyte response. Bigler, Clifton and Werner made careful leukocyte counts before, during and after administration of the drug to thirty-three patients, some without infection and some with various types of infection. They gave by mouth 1 Gm of sulfanilamide to every 20 pounds (9 Kg) of body weight, irrespective of age, over a period of several days. In no instance did the administration of sulfanilamide cause an increase in the leukocyte count. They believe that in these cases the drug caused a depression of leukocytes not only because of two instances of leukopenia but because of the spectacularly rapid fall in the leukocytes at the end of an infection, which was often followed by a moderate increase in leukocytes after the drug was discontinued. These clinical observations indicated an absolute reduction of all the leukocytes without any characteristic relative change. Granulocytopenia, however, did not occur among the thirty-three patients. These authors, like many others, found sulfanilamide to be effective in beta hemolytic streptococcus infections. Its effective action is, they believe, independent of the leukocytes, since it did not produce an increase in their total number or increase the proportion of polymorphonuclear cells.

Along with these clinical studies, Osgood's report on the mode of action of sulfanilamide, on page 349, is of great interest. In several series of experiments in vitro, Osgood studied the effect of various dilutions of sulfanilamide on the beta hemolytic streptococcus, some cultures of which also contained living human marrow cells. His experiments seem to indicate that a concentration of sulfanilamide of 1:100,000, which is about ten times as dilute as the concentration ordinarily used clinically, is just as effective in vitro as the more concentrated solutions. Sulfanilamide in a concentration of 1:1,000 did not kill

the strain of beta hemolytic streptococcus used in the experiments. The major action of sulfanilamide seemed to be the neutralization of the toxin of the beta hemolytic streptococcus, in other words, its chief action was similar to that of an antitoxin. Sulfanilamide did cause a decrease in the rate of division of the organisms and neutralized the toxin produced by them, it also permitted the human serum and to some extent phagocytosis by leukocytes to kill organisms which they otherwise would be unable to kill. The experimental observations would seem to coincide with the clinical observations of Bigler, Clifton and Werner, and others, in that the action of sulfanilamide appears to be largely independent of the leukocytes. Marshall and others,¹ working with dogs and rabbits, reported, in *THE JOURNAL* last week, that repeated large doses produced no consistent effect on the red, white or differential cell count. Osgood's experiments appear to show also that sulfanilamide in concentrations even greater than those generally employed clinically did not have a direct toxic action on the nucleated cells of the majority of bloods and marrows studied, nor did it have any direct action that favored leukocytosis. It is emphasized, however, that such observations do not exclude an occasional idiosyncrasy in patients whose leukocytes react differently to this drug. Such idiosyncrasy would explain the development of occasional cases of granulocytopenia. As pointed out previously in the Report of the Council on Pharmacy and Chemistry, it is advisable in using sulfanilamide to examine the blood microscopically for evidence of possible deleterious effects on the red and white cells.

GASTROSCOPY

The knowledge to be derived from direct inspection of the interior of the hollow viscera led to the development of cystoscopy, bronchoscopy and proctoscopy. Kussmaul in 1868 was the first to attempt the visualization of the gastric mucosa with the aid of a straight, rigid tube. The ingenious Mikulicz in 1881 developed an elbowed gastroscope with a lamp at the end and the objective of the optical system just proximal to the light. The instrument was equipped with an air channel through which the stomach could be inflated. The Mikulicz gastroscope was an important advance, as it possessed almost all the features present in the modern gastroscope. The passage of a thick, rigid tube, however, was fraught with many hazards such as the perforation of the esophagus. It therefore found few adherents in this country.

Schindler,¹ after considerable experience with the rigid instrument, concluded that a proper gastroscope should be flexible from a point about 3 cm above the cardia to the distal end of the tube. The solution of this difficult optical and mechanical problem, according to him, became possible only when it was discovered

that a tube filled with thick lenses, with a short focal distance, could be bent in several planes to an angle of about 34 degrees without distortion of the image. The Wolf-Schindler flexible gastroscope was brought out in 1932. It is about the thickness of an Ewald stomach tube. The lower part of the instrument is flexible and can be bent to facilitate and make safe its passage through the esophagus. A system of many lenses conveys the image to the eye. The passage of the instrument was now free from the former hazards. The contraindications to its use need not, according to Schindler, Henning, Benedict and others, be more stringent than those against passage of an ordinary stomach tube. Among these must be mentioned aortic aneurysm, esophageal varices and strictures of the esophagus and of the cardia. The patency of the esophagus in doubtful cases may be determined by the passage of a stomach tube or by fluoroscopy.

The sharpness of the picture and the clarity of the view, according to Schindler, are quite remarkable. Erosions, small hemorrhages and pigment spots can be seen quite distinctly. The normal mucous membrane presents a brilliant picture—glistening, bright orange-red. Beyond the incisura angularis, which appears as a fold, the antrum of the stomach comes into view. By rotating and gradually withdrawing the flexible distal half of the instrument, one can usually see the remainder of the stomach and fornix. The normal mucous membrane often contains small hemorrhages and pigment spots the significance of which is not understood.

Gastric ulcer presents a yellow or grayish white floor and a sharp edge, the entire lesion being sharply circumscribed. The surrounding mucous membrane may be normal or it may appear swollen, edematous and hyperemic, denoting an accompanying gastritis. Malignant ulcers present, according to Schindler, a decidedly different picture. The floor of such an ulcer is dark brown or violet, the edge is ragged and irregular, the surrounding mucous membrane appears rigid, infiltrated and often grayish or white rather than orange-red. Schindler believes that the differential diagnosis between a benign and a malignant ulcer can be made with greater certainty by gastroscopy than by any other procedure. The colors, owing to the circulating blood and the reflecting light, are more intense when viewed through the gastroscope than when viewed in the gross specimen.

Gastroscopy, however, is not to be regarded as a competitor of roentgenology. The judicious employment of both should result in far more frequent diagnoses of early gastric cancer. The pessimism attending the surgical treatment of gastric cancer and of the exploratory operation is entirely due to the late diagnosis of the condition. Schindler² in a later communication stressed the fact that operative intervention for early gastric cancer frequently resulted in cure of

¹ Marshall E. K. Jr., Cutting W. C. and Emerson Kendall Jr.: The Toxicity of Sulfanilamide. *J. A. M. A.* 110: 252 (Jan. 22) 1938.
² Schindler Rudolf: Diagnostic Gastroscopy with Special Reference to the Flexible Gastroscope. *J. A. M. A.* 105: 352 (Aug. 3) 1935.

² Schindler Rudolf and Giere Norman: Gastric Surgery and Gastroscopy. *Arch. Surg.* 35: 712 (Oct.) 1937.

long duration. He suggested that every patient over 35 years of age who suffers from anorexia or significant loss of weight and in whom no other explanation for the symptoms is present should be submitted to a gastroscopic and roentgenographic study. Surgical mortality can be lowered by excluding from operative interventions those patients in whom gastroscopy demonstrates a diffuse infiltrating lesion.

But the greatest field of usefulness for the gastroscope is in gastritis. The occurrence, the frequency and the significance of chronic gastritis in gastric symptomatology were first revealed by the gastroscope. In Benedict's³ experience gastroscopy is superior to the roentgenographic method of relief study in demonstrating the existing inflammatory states of the gastric mucosa. In a series of seventy-five gastroscopic examinations Benedict made a diagnosis of gastritis twenty-two times, ten times in association with duodenal ulcer, two times with gastric ulcer, three times with carcinoma, two times as a postoperative condition after resection, and five times without other pathologic change. The latter cases, according to Benedict, are of the greatest interest, for in them the final diagnosis rests primarily on the gastroscopic observations. Schindler distinguishes three types of chronic gastritis based on gastroscopic appearances: 1. Superficial gastritis with small red hyperemic areas and occasionally small erosions. 2. Atrophic gastritis in which the normal orange-red appearance is replaced by a gray-green, in which the course of the blood vessels may be traced, in the normal mucosa the blood vessels are not discernible. 3. Hypertrophic gastritis, in which the mucous membrane is velvet-like and swollen and contains a number of nodules or wartlike excrescences with numerous creases between the elevations. Frequently small and superficial ulcers are present. The author did not volunteer an opinion as to the exact relationship of this condition to chronic gastric and duodenal ulcers. Schindler's observations in postoperative patients lend support to the opinion of most gastroscopists and many surgeons that chronic gastritis is the most frequent and the most important postoperative complication. Of thirty postoperative patients, sixteen presented this condition. In two of the patients it gave rise to severe hemorrhage. The etiology of postoperative gastritis is obscure. Schindler made the interesting observation that this complication was absent in patients in whom a rhythmically functioning gastroenterostomy stoma was present. In patients with a patent stoma the constant reflux of intestinal juices may cause and maintain the inflammation.

The visualization of the gastric mucosa with the aid of the flexible gastroscope is no longer the dreaded ordeal attending the passage of the rigid instrument. The method is capable of furnishing much valuable

information as to the presence, the character and the extent of a gastric lesion. It reveals inflammatory changes of the gastric mucosa not demonstrable by other methods. Again science and medicine have benefited by the developments that have featured the coming of the machine age.

Current Comment

BRITISH HEALTH SERVICES REVIEWED

An independent nonparty group, consisting of more than a hundred members, called "Political and Economic Planning," has recently published an extensive review of the British health services.¹ The report has taken three years to compile. As pointed out in the *British Medical Journal*, this survey was one of the most difficult tasks which P.E.P. has undertaken because of the bewildering number of fragmentary and often conflicting specialisms and the differences of attitude and approach. That such divergences occur in England is not surprising, but that conflicting requirements exist in an even greater degree in this country scarcely requires comment. The survey reviews the impersonal protective services including housing and sanitation, passing to the health of the industrial worker and the specialized services for mothers and infants, the preschool child and the school medical service. After a description of the organization of the medical profession (in an only partially accurate manner, according to the *British Medical Journal*), the training of the student, the working conditions of the general practitioner, the consultant and the public health officer, the way is opened for the broad consideration of national health insurance. There are 19,000 insurance practitioners in Great Britain, giving 50 million attendances a year. More than 5 million persons participate in hospital contributory schemes. A thousand voluntary hospitals treat approximately 1¼ million inpatients and nearly five times as many outpatients yearly. More than 150,000 mental patients are maintained out of public funds. This report claims to be the first attempt to show how all the health services in Great Britain fit together, what they have achieved, and where their defects and problems lie. The standard of factual accuracy is high, but some errors of importance have crept in, as pointed out editorially by the *British Medical Journal*.² The report inclines toward the extension of medical benefits and believes that the cost must be met by insurance. The extensions should include not only dependents of those already insured but independent workers earning less than £250 (\$1,250) a year, their dependents, and additional consultant and specialist services when necessary. The estimated number of dependents is 15 million. The number of independent workers is 1,030,000 and of their dependents about

3 Benedict, E. B. Examination of the Stomach by Means of a Flexible Gastroscope. *New England J. Med.* 210: 669 (March 29) 1934.

1 Report on the British Health Services. P.E.P. 16. Queen Anne's Gate, London S.W. 1.
2 A Survey of the British Health Services. *Brit. M. J.* 2: 17 (Dec. 18) 1937.

850,000 At a per head fee of 9 shillings (approximately \$225), extension of the present medical benefits to these persons would cost £10,130,000 (\$51,000,000) annually Such estimates cannot be considered to offer an accurate financial calculation, since many questions as to the size of the premium, as well as the extent of the benefits, are still subjects of intense debate The dissatisfaction with the present extent of medical benefits in that much more homogeneous country should give pause to those who believe that a national working scheme can be immediately introduced in the United States, where local conditions vary to a much greater extent

INTELLIGENCE RATING OF THE ALLERGIC CHILD

In 1929 Balyeat¹ tested the "intelligence quotient" or "mental age" of eighty allergic children and compared it with the intelligence rating of eighty nonallergic children of the same age and environment His data indicated that most allergic children are far above the normal level of mental activity His conclusion was the subject of an editorial² in *THE JOURNAL* and has been perpetuated in several popular articles and textbooks dealing with psychologic problems Numerous hypotheses have been proposed to account for this reported mental superiority of the allergic child Most of these theories are based on an assumed greater acuity of the special senses of allergic individuals, an assumed greater speed of propagation of the nerve impulse or an assumed shortening of reaction time On account of the practical therapeutic interest of these theories, a statistical restudy of the correlation between clinical allergy and mental ability was undertaken by Piness, Miller and Sullivan³ of the Allergy Clinic at Los Angeles Children's Hospital The California clinicians first determined the so-called intelligence quotient of 145 allergic children, using four different psychologic methods An equal number of nonallergic school children of the same age group were used as controls As further controls, 103 epileptic children were tested Considerable differences were noted between the epileptic and the normal group The epileptic group included a few children of superior levels of intelligence The group as a whole, however, was of much lower average intelligence, owing to the relatively large number of epileptic children falling in the inferior and feebleminded range of the intelligence spectrum In contrast with this difference, the allergic group showed a percentage distribution in this spectrum practically identical with the control normal group Within the limits of the statistical error, therefore, allergic children show neither the alleged mental superiority nor any apparent mental retardation, when compared with the nonallergic children of the same age group and environment The allergic group showed slightly more school retardation than would be expected if their illness had not handicapped them

¹ Balyeat R M The General Health and Mental Activity of Allergic Children *Am J Dis Child* 37 1193 (June) 1929

² The Mental Activity of Allergic Children editorial *J A M A* 93 923 (Sept 21) 1929

³ Piness George Miller Hyman and Sullivan Ellen B *J Allergy* 5 168 (Jan) 1937

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

CALIFORNIA

Society News—The Fresno County Medical Society was addressed December 7 by Drs Stacy R Mettler and Harry Glenn Bell San Francisco, on purpura haemorrhagica and acute conditions of the gallbladder respectively Both physicians addressed the Humboldt County Medical Society December 2 in Eureka on "Medical Aspects of Arthritis" and 'Acute Cholecystitis' respectively—At a meeting of the Kern County Medical Society in Bakersfield recently Dr Ernest C Dickson San Francisco, spoke on "Relation of Coccidioides Infection to 'Valley Fever'"—The Placer County Medical Society was addressed in Auburn December 11 by Drs Thomas I Buckley, Oakland on "Urinary Antiseptics" and Robert S Peers, Oakland, Relation of Gallbladder Disease and the Rheumatic Syndrome—At a meeting of the Sacramento Society for Medical Improvement, November 16, Drs Laurence R Taussig, San Francisco, spoke on 'Dermatological Conditions Associated with Diabetes Mellitus' and Harry C Sheppardson Use of Prolonged Acting Insulins—The San Bernardino County Medical Society was addressed in San Bernardino December 7 by Drs Hugh K Berkley, Los Angeles, on 'Use of Convalescent and Normal Human Serum in the Treatment of Disease' and Clarence M Hyland, Los Angeles, "The Convalescent Serum Center and Its Value to the Community"—At a meeting of the San Joaquin County Medical Society December 2, Dr Philip King Brown, San Francisco, read a paper entitled These Changing Times in Medicine With an Interpretation of Some Observations on Medical Practice in Mexico'

ILLINOIS

Health Officer for Twenty-Five Years—Dr Alban L Mann has resigned as health officer of Elgin, a position he has held since 1912 Although he retired from active service January 1, Dr Mann will serve the city health department in an advisory capacity until June 30 A resolution was recently adopted by city council members in which Dr Mann's services were termed "long, faithful and distinguished" He is 78 years of age

Society News—Dr Abraham F Lash, Chicago, discussed "Puerperal Sepsis" before the Peoria City Medical Society January 4—The Rock Island County Medical Society was addressed January 11 by Drs Roger T Vaughan and Philip Thorek, Chicago, on "Abdominal Auscultation" Dr Meredith H L Ostrom, Rock Island, read a paper on "The Significance of Pam About the Ear"—Dr Francis E Sencar, Chicago, discussed 'Early Diagnosis and Treatment of Syphilis' before the St Clair County Medical Society January 6

Chicago

Dr Hertzler to Give Ranson Lecture—Dr Arthur E Hertzler, professor of surgery, University of Kansas School of Medicine, Kansas City, will deliver the annual Stephen Walter Ranson Lecture at Thorne Hall, Northwestern University Medical School February 15, under the auspices of Theta of Phi Beta Pi His subject will be "The Thyroid Heart"

Branch Meetings—At a meeting of the Douglas Park Branch of the Chicago Medical Society January 18 Dr Aaron Arkin discussed the present-day concept of hypertension from the clinicopathologic view and Dr Louis N Katz from the physiologist's view Dr Stanley Gibson addressed the Southern Cook County Branch January 18 on 'Childhood Diseases and Their Immunological Aspects' At a meeting of the West Side Branch January 20 Dr Charles Marshall Davison showed a motion picture on 'The Technique of Thyroidectomy' The Jackson Park Branch was addressed January 20 by Drs Edward J Steglitz on "Renal Function", S Kenneth Robinson 'The Nature of the Anuria and Uremia After Surgical Operation and Blood Transfusion', Leon Unger 'Migraine' and Francis P Hammond, Behind the Scenes in Medical Ethics" Dr James K Stack discussed 'Injuries of the Wrist' before the Calumet Branch January 21 The Northwest Branch January 27 heard Drs Herman L Krtschmer discuss "Problems in the Diagnosis of Tumors of the Kidney" At a meet-

ing of the Irving Park Branch January 25 Dr George L. Apfelbach spoke on "Emergency Trauma—First Aid That Aids Later Reconstruction"

IOWA

Interprofessional Association—The executive council of the Iowa Interprofessional Association, with special representatives from the component state societies, met at Des Moines, December 19, to discuss plans for an interprofessional program to be held as part of the annual program of each of the groups in rotation. The constituents of the interprofessional group are the Iowa Pharmaceutical Association, Iowa State Dental Society, Iowa State Association of Registered Nurses, Iowa Veterinary Medical Association and the Iowa State Medical Society.

Society News—At the annual meeting of the Davis County Medical Society in Bloomfield, December 10, Drs George H. Clark spoke on urologic diagnosis, Max R. Greenlee, allergic rhinitis, and Walter V. Campbell, water balance, all are of Oskaloosa. The Jackson County Medical Society was addressed at Maquoketa December 17 by Drs Ruben Nomland, Iowa City, and Jesse Carl Painter, Dubuque, on "Diagnosis and Treatment of Common Diseases of the Skin" and "The Eradication of Tuberculosis." At a meeting of the Johnson County Medical Society, December 1, Drs William Malamud, Iowa City, discussed "A Clinical Definition of the Psychoneuroses" and Andrew H. Woods, Iowa City, "The Ingredients of Psychoneurosis in Normal Behavior." Speakers before the Lee County Medical Society in Donnellson, December 14, included Drs Paul J. Zentay, St. Louis, "Experiences in the Recent Epidemic of Encephalitis, Type B", John Albert Key, St. Louis, "Principles of Treatment for Fractures of the Elbow and Wrist" and George E. Shambaugh, Chicago, "Recent Advances in the Prevention and Treatment of Deafness." The medical and veterinary societies of Marion County held a joint meeting in Knoxville December 2, speakers were Dr Tom B. Throckmorton, Des Moines, on virus disease of man, H. E. Beister, D.V.M., Ames, neurotropic infections, and Dr Francis M. Roberts, Knoxville, "Twenty Years in the Practice of Medicine in Marion County." Dr Roberts has just entered his fourth term as president of the county medical society.

KANSAS

Graduate Courses of County Society—The Shawnee County Medical Society, Topeka, will sponsor a series of graduate courses as a part of its enlarged program for 1938. The first course was to begin the third week of January, to run once a week for six weeks. It will be conducted by Dr Arthur K. Owen on "X-Ray Diagnosis of Disorders of the Chest." Other courses include one on psychoanalysis, the electrocardiograph and hematology, with Drs Robert P. Knight, James G. Stewart and John L. Lattimore, respectively, as the speakers. The society will also publish a bulletin on the first or each month from September to May. To finance the expanded activities, the dues of the society have been increased from \$1 to \$10, the state medical journal reports.

KENTUCKY

Society News—Drs George Ezra Titsworth, Bandana, and Blanton E. Russell, Clinton, addressed the Ballard-Carlisle-Hickman Counties Medical Society in Arlington, December 7, on progress of medicine and surgery in the past fifty years and epidemic meningitis, respectively. Speakers before the Jefferson County Medical Society, Louisville, January 17, were Drs David Y. Keith, on "The Physics of Radium Therapy", Robert L. Kelly, "The Use of Radium and X-Rays in Skin Lesions," and Jess Hill Love, "Results of Radium Treatment of Carcinoma of the Cervix", all are of Louisville. Dr Russell L. Haden, Cleveland, delivered an address at the annual meeting of the Louisville Medico-Chirurgical Society, January 14 on "Early Microscopes and Early Microscopists."

MAINE

Personal—Twelve members of the Androscoggin County Medical Society who have been in practice for thirty-five years or more were honored at a dinner meeting recently. They are Drs William L. Haskell, Wallace E. Webber, Frederick S. Wakefield, Joseph J. Pelleuter, Sullivan L. Andrews, Edwin F. Pierce, all of Lewiston, Albert W. Plummer, Lisbon Falls, Oscar E. Hanscom, Greene, George H. Rand, Livermore Falls, and Ward I. Renwick, Clarence C. Peaslee and Guy H. Hutchins, all of Auburn. Dr John G. Towne, Waterville, was the toastmaster.

Society News—Dr Edward H. Risley, Waterville, addressed the Waldo County Medical Society in Belfast, January 19 on "Cancer of the Rectum and the After Care of Colostomies." Dr George W. Holmes, Boston, addressed a recent meeting of the Cumberland County Medical Society on "Pulmonary Hemorrhage with Special Reference to Differential Diagnosis by X-Ray." Dr Forrest C. Tyson, medical superintendent of the Augusta State Hospital, discussed "Psychogenic Factors in the Causation of Mental Disorders" before the Kennebec County Medical Association, December 16. Dr Julius Gottlieb, Lewiston, discussed "Laboratory Aids to Diagnosis" before the Sagadahoc County Medical Society, November 16.

MASSACHUSETTS

Hospital News—The new cancer-tuberculosis unit of the Westfield State Sanatorium was opened for admission of patients Nov. 29, 1937. It provides fifty beds for the treatment of cancer and 144 beds for patients with pulmonary tuberculosis. The cancer section includes a complete surgical unit with two operating rooms, a radiologic unit with diagnostic and high voltage therapy apparatus and radium needles, and an outpatient department. The tuberculosis section provides all facilities for the diagnosis and modern treatment including thoracic surgery, and all operative procedures will be carried out at the sanatorium.

MICHIGAN

Society News—Dr Theophil Klingmann discussed "The Mechanism of the Psychoneuroses" before the Washtenaw County Medical Society in Ann Arbor, January 11. The Muskegon County Medical Society was addressed by Dr Harry A. Towsley and John J. Englefried, Ph.D., Ann Arbor, on "Studies in Sulfanilamide." Dr Harold A. Miller, Lansing, discussed "The Care of the Indigent in Ingham County" before the Genesee County Medical Society, January 19.

Placement Service for Physicians—The Michigan State Medical Society has created a placement service to help any community that may need a doctor of medicine and to assist young physicians about to enter practice or older physicians to find locations. A survey of the eighty-three counties of the state is now under way to ascertain the need for any additional medical service anywhere in Michigan. A permanent spot-map in the society's executive office in Lansing will indicate where doctors may be needed, and full information statistics and documents will be furnished to medical applicants.

MINNESOTA

Division of Neurosurgery—A teaching and hospital division of neurosurgery has been created in the department of surgery at the University of Minnesota Medical School, Minneapolis. Dr William T. Peyton, associate professor of surgery, is the director of the division and other members of the staff are Drs Arthur A. Zierold, professor, James Frank Corbett, clinical professor, Wallace P. Ritchie, clinical assistant, and George R. Dunn, clinical assistant professor.

MISSOURI

Special Courses in Jackson County—Courses in various subjects are being planned for members of the Jackson County Medical Society, according to its *Weekly Bulletin*. The series opened January 18 with a course covering a review of chemical analyses of blood, urine and gastric secretions and a study of tests of liver and kidney function and of hormones, James C. Rice, Ph.D., instructor in chemistry, Kansas City Junior College, will be in charge. Other courses include:

Clinical Bacteriology, February 13, Miss Dorothy D. Dixon, bacteriologist, Kansas City Municipal Hospital.
Postmortem Pathology, February 13, Drs Cecil G. Leitch and Russell W. Kerr.
Instruction for Medical Speakers, February 15, Albert H. Johnstone, formerly director of the school of speech of the Horner Conservatory and College.

NEBRASKA

Society News—Dr Everett D. Plass, Iowa City, addressed the Omaha-Douglas County Medical Society, December 14, on "Experiences with Rupture of the Membranes as a Method of Inducing Labor" and Dr John Jay Keegan, Omaha, on "Clinical Pathology of Brain Tumors." Drs John C. Thompson and Karl S. J. Hollen, Lincoln, addressed the Southwestern Nebraska Medical Society in McCook recently on "Newer Ideas of Endocrine Therapy" and "Sublethal Hematomas" respectively. Drs Norman Reider, Topeka, Kan., and Richard F. Richie, Lincoln, addressed the Madison County Medical Society in Norfolk on "Headaches" and "Child Welfare Work in Nebraska" respectively.

NEW YORK

Gastro-Enteritis Following Banquet—Seventy-three out of 250 guests at a banquet in Poughkeepsie December 4 became ill one or two days after the dinner with symptoms of a mild gastro enteritis. Results of an investigation pointed to a seafood cocktail as the probable cause of the illness, but the ingredient responsible and the mode of contamination were not determined. As few of the patients were ill enough to call a physician, laboratory specimens were not obtained and specimens submitted by five patients after recovery showed no pathogenic organisms. Recovery was prompt.

Examination for District Health Officer—The New York State Department of Health announces an examination to be held February 26 for the position of district health officer at a salary of \$5,000 a year. Applications must be mailed not later than February 4. Candidates must be graduates in medicine and must be licensed or eligible for license to practice in New York. They must have completed a course in a school of public health approved by the Public Health Council of at least one academic year in full time residence. In addition they must have had five years' full time experience in a responsible position in a state, city or county department of health involving general public health work and administrative duties. They shall not have been engaged in the private practice of medicine while gaining the requisite public health experience. Candidates must demonstrate a knowledge of the broader aspects of public health and special ability in administrative work. Applications may be obtained by addressing the New York State Department of Health, Albany.

New York City

Portrait Unveiled—A life size portrait of the late Dr Glentworth Reeve Butler was recently presented to the Medical Society of the County of Kings by Mrs Butler and unveiled at a ceremony November 16. Dr Robert L Dickinson made the presentation address, and the portrait was accepted by Dr Edwin P Maynard Jr, assistant directing librarian and curator of the society.

Appointments at Polyclinic Medical School—Dr Thomas G Tickle has been appointed professor of otolaryngology at the New York Polyclinic Medical School and Hospital. Dr Tickle graduated from the University of Maryland School of Medicine in 1916. Dr David H Jones has been made clinical professor of bronchoscopy and Dr Ernest E Smith adjunct professor of roentgenology.

Illegal Practitioners Convicted—The New York State Board of Medical Examiners has recently announced conviction of the following illegal practitioners:

Auguste Holm sentenced to serve three months in the workhouse with execution of sentence suspended.

Joseph Tuhoglowicz, sentenced to pay a fine of \$100 in default of which he was to serve thirty days and in addition a suspended sentence of three months in the workhouse.

William T Truitt sentenced to pay a fine of \$100 in default of which he was to serve thirty days and in addition a suspended sentence of three months in the workhouse.

David Bader sentenced to a term of one year in the New York County Penitentiary.

Health in 1937—Health Commissioner John L Rice in his annual report for 1937 announced that 77,466 deaths occurred during the year, giving a death rate of 10.4. Last year's rate was 10.5. The infant mortality rate was 43.7 per thousand live births, the lowest rate ever recorded in the city. The city made a special drive against pneumonia during the past year, establishing a division of pneumonia control and pneumococcus typing stations in each borough, which went into action near the end of the year. There were 6,505 deaths from pneumonia in 1937, a death rate of 87.5 per hundred thousand of population. Automobile deaths increased in 1937 after having decreased each year since 1929: the number for the past year was 977 as compared with 930 the previous year, a rate of 13.1 for 1937. Other accidents caused 3,173 deaths as compared with 3,241 in 1936. Tuberculosis, for which the death rate rose in 1936 to 62.2 after having dropped to 59.9, caused 4,263 deaths, giving a rate of 57.3 for all forms of the disease. Deaths from appendicitis were also fewer in 1937 than in 1936, 934 as compared with 1,050. Because of the aging of the population, chronic diseases of later life are constantly increasing, Dr Rice reported. They are responsible for nearly 60 per cent of all deaths in the city. For diabetes the death rate for 1937 was 35.9 per hundred thousand; for cancer it was 144, for diseases of the heart, arteries and kidneys and cerebral hemorrhage, it was 437.4. There were fifty eight deaths from diphtheria, twenty five from measles, forty nine from whooping cough and thirty-one from scarlet

fever. Polymyelitis caused eighteen deaths and meningitis ninety. The suicide rate again declined, it was 15.1 in 1937 and 15.2 in 1936. For the first time in ten years the birth rate was slightly higher than it was in the preceding year, 13.7 in 1937 as compared with 13.4 in 1936.

OHIO

Graduate Course at Toledo—Dr Walter C Alvarez, professor of medicine, Graduate School of Medicine University of Minnesota, Rochester-Minneapolis, will be the instructor in the fourteenth annual graduate course presented by the Toledo Academy of Medicine February 1-5, on diseases of the gastro-intestinal tract. The lectures will be given each afternoon from 4:30 to 6:30.

Personal—Dr Louis P H Bahrenburg, director of the U S Marine Hospital of the Public Health Service at Cleveland, went on the retired list at the end of 1937. He has been in charge of the hospital at Cleveland since 1930. His successor is Dr Frank M Paget, senior surgeon in the service, who has been stationed at the Marine Hospital in Louisville, Ky. —Dr Kurt C Becker, Royal Oak, Mich., has been appointed health commissioner of Troy and Miami County to succeed the late Dr Edgar R Hiatt, Troy.

Annual Health Lectures—The annual series of health lectures for the public sponsored by the Academy of Medicine of Cleveland, the Albert Fairchild Holden Foundation of Western Reserve University and the Cleveland Medical Library Association will begin Sunday January 30. The first address will be given by Dr John S Coulter, Chicago, on "Restoring Health by Heat, Exercise, Light and Electricity." Dr Charles L Hudson, Cleveland, will deliver the second lecture February 13 on "Eat, Drink and Be—Fat." Drs John A Toomey and Maxwell Harbin will tell "What Is Known About Infantile Paralysis" February 27. Dr Toomey will discuss the early stages and Dr Harbin the late effects of the disease.

Society News—Dr Louis J Karnosh, Cleveland, addressed the Ashland County Medical Society, Perrysville, December 10, on "The Psychiatric Aspect of Genius." —Dr Jonathan Forman, Columbus, addressed the annual meeting of the Cleveland Medical Library Association January 21 on "The Beginnings of Medical Education." —Dr Clifford J Strachley, Cincinnati, addressed the Ross County Medical Society, Chillicothe, December 2, on "The Importance of Syphilis, Pernicious Anemia and Hyperthyroidism in Heart Disease." —Dr Ralph E Pickett, Newark, addressed the Licking County Medical Society, Newark, recently on "Treatment of Compound Fractures." —Dr Perrin H Long, Baltimore, addressed the Academy of Medicine of Cincinnati January 11 on "The Use of Sulfanilamide or Its Derivatives in the Treatment of Certain Infectious Diseases." —A symposium on advances in surgery during 1937 was presented before the Montgomery County Medical Society, Dayton, January 21, with Drs Walter A Reiling, Raymond E Tyvand and Herbert L Brumbaugh, Dayton, as the speakers.

OKLAHOMA

Correction—The new requirement of three years' premedical education for admission to the University of Oklahoma School of Medicine, announced in THE JOURNAL, January 15, page 218, will go into effect with the freshman class to enter in September 1939 and not next September, as inadvertently stated in the news item.

PENNSYLVANIA

Personal—Dr David A Johnston, Hazleton, has been appointed surgeon and medical officer for the Pennsylvania Motor Police. —Dr S Gilmore Pontius, Lancaster, has been elected a trustee of Franklin and Marshall College to succeed the late Dr Theodore B Appel.

Society News—Drs Walter Estell Lee and Gabriel Tucker, Philadelphia, addressed the Locomotive County Medical Society, Williamsport, January 14, on "Diagnosis and Treatment of Lung Abscess." —Attorney General Charles J Margiotti, Harrisburg, addressed the York County Medical Society York, January 3, on "Socialized Medicine." —Dr Donald Guthrie Savre, addressed the Northampton County Medical Society, Easton, January 21, on "Mortality in the Complications of Appendicitis."

Philadelphia

Dr Griffith Appointed Dean of Pharmacy College—Ivor Griffith, Ph.D., assistant dean of pharmacy and professor of theory and practice of pharmacy at the Philadelphia College of Pharmacy and Science, has been appointed dean

to succeed the late Charles H. LaWall. Dr. Griffith, a native of Wales, was graduated from the college in 1912 and has been a member of the faculty since 1916. He has been editor of the *American Journal of Pharmacy* since 1921.

Society News—The section on internal medicine of the Philadelphia County Medical Society held a meeting on hypertension January 26 in which the first hour was devoted to three round table discussions followed by an open meeting. Drs. Norman E. Freeman, Edward Weiss and George P. Müller were the leaders of round tables on experimental hypertension, medical treatment and surgical treatment, respectively. At the open meeting the leaders summarized the discussions. Among other speakers on the program of the Physiological Society of Philadelphia January 17 were Dr. Stuart Mudd, C. J. Czarnetzky, Ph.D., and M. G. Sevag, Ph.D., on "The Action of Sodium Bisulfite and Sulfanilamide on Purine and Pyrimidine Compounds with the Production of Hemolysis and a Suggested Mechanism of the Action of Sulfanilamide on Hemolytic Streptococci." Dr. Ernest Granville Crabtree, Boston, delivered the annual B. A. Thomas Annual Oration of the Philadelphia Urological Society January 24 on "Fluid Balance in the Puerperium."

Pittsburgh

Personal—Dr. I. Hope Alexander has been reappointed director of health of Pittsburgh. Dr. Norman R. Goldsmith, who has been associate editor of the *Pittsburgh Medical Bulletin* since June 1936, recently resigned, he will take a position with the Roche-Organon Company, Nutley, N. J.

SOUTH DAKOTA

Society News—Dr. Henry W. Meyerding, Rochester, Minn., discussed "The Treatment of Fractures" before the Watertown District Medical Society at Watertown recently. Dr. Cyrus O. Hansen, Minneapolis, was the guest speaker before a recent meeting of the Seventh District Medical Society on "Recent Advances in X-Ray Treatment."

Sioux Valley Meeting—The Sioux Valley Medical Association held its annual winter meeting at the Cataract Hotel in Sioux Falls, January 19-20, with the following speakers, among others:

Dr. Charles N. Hensel, St. Paul: The Irritable Heart With and Without Valve Lesions.
Dr. Alfred W. Adson, Rochester, Minn.: Causes and Treatment of Chronic Sciatica.
Dr. Roger L. J. Kennedy, Rochester, Minn.: Bone Changes That Take Place in Various Diseases in Infants and Children.
Dr. Jay Arthur Myers, Minneapolis: Controlling Tuberculosis in a Community.
Dr. Leroy H. Sloan, Chicago: The Correlation of the Clinical Picture of Acute Vascular Insults.
Dr. Clifford J. Barborka, Chicago: Treatment by Diet in Disease.
Dr. August A. Werner, St. Louis: Anterior Pituitary Gland Relationship in the Female with Clinical Application.
Dr. James J. Callahan, Chicago: Fractures of the Neck of the Femur.

Dr. Adson addressed the annual banquet on "Medical Economics."

GENERAL

Academy of Dermatology and Syphilology Organized—At a meeting attended by more than 300 dermatologists in Detroit, January 14-15, the American Academy of Dermatology and Syphilology was organized with the following officers: Drs. Howard Fox, New York, president, Paul A. O'Leary, Rochester, Minn., vice president, Earl D. Osborne, Buffalo, secretary, and Clyde L. Cummer, Cleveland, treasurer. In addition to the officers, the following were elected to a board of directors, Drs. Samuel Ayers Jr., Los Angeles, Theodore Cornbleet, Samuel W. Becker and Clark W. Finerud, Chicago, Harther L. Keim, Detroit, Joseph V. Klauder and Frank C. Knowles, Philadelphia, Everett S. Linn, Oklahoma City, Henry E. Michelson, Minneapolis, Marion B. Sulzberger, New York, and Martin T. Van Studdiford, New Orleans.

Motor Vehicle Deaths Increase in 128 Cities—The Bureau of the Census has issued a summary of deaths from motor vehicle accidents in 1937, showing that in 128 major cities of the United States there were 9,964 deaths in 1937 as compared with 9,308 in 1936, an increase of 7 per cent. A major part of the increase occurred in the first six months of the year. Sixty-six cities showed an increase, fifty-seven a decrease and five had the same number as the previous year. For the large cities of 500,000 or more population the following changes occurred for 1937: New York, 35 per cent increase; Chicago, 62 per cent increase; Detroit, 62 per cent increase; Los Angeles, 97 per cent increase; Cleveland, 141 per cent increase; St. Louis, 17 per cent decrease; Baltimore,

172 per cent increase; Boston, 37 per cent decrease; Pittsburgh, 55 per cent decrease; San Francisco, 222 per cent increase; Milwaukee, 45 per cent decrease; Buffalo, 305 per cent increase; Washington, 176 per cent increase.

Eyesight Swindler Dies—Matthew O. Wilkinson, one of two brothers whose operations throughout the country as eyesight swindlers have been frequently described in *THE JOURNAL*, is reported to have died at the Virginia State Prison Farm Nov. 4, 1937, according to *California and Western Medicine*. His brother is said to be Elliott Wilkinson. Serving a sentence brought about by his conviction of using the mails to defraud, Wilkinson was one of several swindlers arrested and sentenced following an investigation by the U. S. Post Office Department. The swindlers sent checks through the mails to an attorney in Milwaukee named Mackett, who deposited them for collection, remitting the proceeds, less 10 per cent commission, to the swindlers. Mackett was recently sentenced to three years in the federal prison at Chillicothe, Ohio. Wilkinson, alias Dr. Billingsley, alias Dr. Clark, alias J. E. Clark, at the time of his arrest Aug. 31, 1936, was wanted in California, where he had been operating his racket for some time. When authorities were beginning to close in on him he went to other states to "practice," it was said.

Changes in Status of Licensure—The California State Board of Medical Examiners reports the following action at a meeting October 19-20:

Dr. Samuel D. Burgeson Jr., Los Angeles: license revoked for an alleged abortion.
Dr. Frederick N. Folsom, Santa Rosa: license revoked for conviction of violation of the state narcotic act.
Dr. Claude C. Long, San Francisco: license revoked based on conviction of manslaughter.
Dr. Thomas O. Luckett, El Centro: license revoked for conviction of abortion.
Dr. E. Blanche Ramer, San Diego: license revoked for alleged illegal operation.
Dr. Eugene L. Settles, Los Angeles: license revoked for violation of probation on narcotic charge.

Report of Macy Foundation—The Josiah Macy Jr. Foundation, established in 1930 by Mrs. Walter Graeme Ladd and her brother Mr. V. Everit Macy as a memorial to their father, has issued a review of its activities in the past six years. From its incorporation up to Dec. 31, 1936, the foundation made 324 grants amounting to \$808,681.75 to thirty-four universities and twenty-seven other agencies of research in the United States, Belgium, Czechoslovakia, France, Germany, Hungary, The Netherlands and Soviet Russia. Its activities have been concentrated in the following fields, the report says: psychosomatic problems, growth development, maturation and aging, social research concerning health and sickness, and medical education. Among the projects aided in these fields are the following: the studies at Harvard of relations of brain wave patterns to personality, experiments in genetics by Clarence C. Little, Sc.D., at the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine, the vitamin research of Dr. Albert Szent-Gyorgyi, Szeged, Hungary, 1937 Nobel prize winner, study of ovulation and the fertilized egg by Gregory Pincus, Sc.D., at Harvard, various studies of circulatory disturbances as part of the aging process, the New York hospital survey of 1937 and the chronic illness survey of 1933, the Committee on Costs of Medical Care, the Commission on Medical Education, studies of child psychiatry at Johns Hopkins, the Graduate Fellowship of the New York Academy of Medicine, and the Advisory Board for Medical Specialties. The grants have ranged from \$150 to \$25,000. In the report are listed the individual grants and a bibliography of the publications describing results of research.

CANADA

Organization for Cancer Control—Through the study committee on cancer of the Canadian Medical Association, a Canadian Society for the Control of Cancer is being organized and a department of cancer control is also to be established within the association. A provisional board of directors for the cancer control society has been set up with Dr. John S. McEachern, Calgary, Alta., as chairman. Other members of the board are Drs. William E. Gallie, George S. Young and Thomas C. Routley, all of Toronto, and three laymen. The society will have branches in each of the nine provinces and a grand council made up of one physician and one layman from each province and five other members selected by that group. The society plans to undertake a project of lay education. The department of cancer control in the medical association has received an annual grant of \$14,000 from the board of trustees of the King George V Silver Jubilee Cancer Fund for Canada. It plans to organize a study group on cancer in every hospital of 100 beds or over and to carry out a program

of medical and lay education. An authorship committee under the chairmanship of Dr. Roscoe R. Graham, Toronto, is engaged in preparing a book dealing with cancer in every site. Drafts of lectures will be prepared for lecturers who desire them. A board of directors for this new activity is being organized, to consist of a representative from each province and Drs. Routley, Young, Graham, Robert I. Harris and William A. Scott, who consented to act as a nucleus.

Government Services

Examinations for Appointment in the Navy

The Bureau of Medicine and Surgery of the Navy Department announces that an examination will be held beginning May 16 at all naval hospitals in the United States and the Naval Medical School, Washington, D. C., for appointment as lieutenant (junior grade) in the Medical Corps of the Navy. Candidates must be between the ages of 21 and 32 years at the time of appointment, must be graduates of class A medical schools and must have completed an internship of one year in a hospital accredited for interns by the American Medical Association and the American College of Surgeons. Information should be obtained from the Surgeon General, Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

Annual Report of Public Health Service

The general death rate in twenty-five selected states in 1936 was 11.3 per thousand of population as compared with 10.8 in 1935, an increase of about 5 per cent, according to the annual report of the surgeon general of the U. S. Public Health Service, Dr. Thomas Parran. This rate is the highest recorded for the death registration area during the past five years. The provisional infant mortality rate for 1936 was 56.9 per thousand live births as compared with 55.7 for 1935, while the maternal mortality rate was 5.1 deaths per thousand live births as compared with 5.3 for 1935. Heart disease, cancer, pneumonia, cerebral hemorrhage and nephritis continued as the leading causes of death. Mortality from tuberculosis failed to decline, but new low death rates were recorded for typhoid, measles, whooping cough, diphtheria and poliomyelitis. Forty-six states reported a total of 4,461 cases of poliomyelitis as compared with 10,744 in 1935 and an annual average of 8,486 cases for the five years ended in 1935. There was about one death registered for every six cases reported, or a total of 723 deaths, in 1936. Neither cholera nor yellow fever appeared in the United States in 1936. Four cases of human plague, without fatalities, were reported, three in California and one in Utah. None were reported from Hawaii, but a number of plague-infected rats were found. Plague infection was found in rodents in California and Utah, and fleas taken from rodents in California, Idaho, Montana, Nevada and Utah were found to be plague-infected. Forty-six states recorded 7,820 cases of smallpox for 1936 as compared with 7,897 in 1935. Thirty-three deaths were reported in 1936. Forty states reported 6,878 cases of meningococcal meningitis as compared with 5,613 for 1935 and 2,314 in 1934. A total of 903 cases of tularemia were reported from thirty-six states and the District of Columbia as compared with 780 in 1935. There were 522,853 cases of venereal diseases reported to the state health departments for the fiscal year 1937 as compared with 434,999 for the same period of 1936. The venereal disease clinic at Hot Springs National Park, Ark., was an important factor in preventing the interstate spread of these diseases. Of 6,806 indigent persons whose medical needs were surveyed during the year, 3,948 or 58 per cent, were afflicted. The Hot Springs Transient Medical Center provided domiciliary care for 2,000 transients while they took treatment in the clinic. The public health service took over the administrative control of the center Oct. 1, 1936.

Hospital and outpatient care was furnished to American merchant seamen and other beneficiaries at 154 ports. 355,810 accredited persons applied for treatment and other medical service. Twelve medical and dental officers were assigned to coast guard ships and stations. There were 136,773 more hospital days furnished to all classes of patients during the fiscal year 1937 than in the same period in 1936. A new hospital ward building was completed and occupied at Memphis, Tenn. Plans for a new marine hospital at St. Louis were completed, the construction to begin at an early date and plans for a new marine hospital at Boston are under way. No quarantable disease was imported into the United States or its depen-

dencies during the year. Officers of the service inspected 16,959 vessels, carrying 846,827 passengers and 1,230,452 seamen, 1,114 vessels were fumigated on arrival at United States ports either because of the occurrence of contagious disease on board or for the destruction of rats as a plague-preventive measure. Examinations for plague infection were made in 4,867 rats recovered. Because medical officers are not available at all officially designated airports of entry in the United States, only 2,499 airplanes, carrying 38,926 persons, of whom 5,841 were aliens, were inspected. There arrived, however, 4,094 airplanes, carrying 45,936 persons. At the various ports of entry 976,055 alien passengers and 806,225 alien seamen were examined by medical officers, with certification to immigration officials for some mental or physical defect or disease being made in the cases of 18,994 passengers and 1,384 seamen. Health service officers attached to American consulates in foreign countries examined a total of 52,913 applicants for immigration visas, 112 of the 19,190 persons examined in the Western Hemisphere and 830 of the 33,723 examined in the Eastern Hemisphere were found to be afflicted with one or more of the defects or diseases which prohibit entry into the United States, while 2,838 of those examined in the Western Hemisphere and 6,847 in the Eastern Hemisphere were certified to American consuls as being afflicted with a disease or condition which was likely to affect their ability to earn a living. Only three of the aliens who had received a preliminary medical examination in American consulates in foreign countries and to whom visas had been issued were certified on arrival at United States ports as being afflicted with a condition requiring deportation. During the year the service inaugurated the system of radio pratique whereby ocean going vessels could be cleared by the ship's surgeon. The new system saves many hours in holding vessels and passengers during quarantine inspection. In only one instance was there a violation of the system.

At the narcotic farm in Lexington, Ky., 1,507 patients were admitted and 1,292 discharged, 182 voluntary patients were received and 131 left against medical advice. Eighty-five per cent of the patients were given occupational therapy. Construction of the initial group of buildings for the narcotic farm at Fort Worth, Texas, was begun Aug. 26, 1936. This unit will consist of the administration building, clinical ward building, maximum custody ward, nurses' home, and roads.

A survey of rural health service for the calendar year 1936 showed that there was a net gain of 311 in the number of counties under full time health administration over the preceding year. There are now six states in which all counties are served by full time county or district health units as compared with three for the earlier period. The percentage of the total rural population with this service is estimated at 41.7. There are still ten states that do not have any local health service corresponding to the generally accepted standards.

The service expended \$1,026,099.23 for emergency and rehabilitation work incident to the Ohio Valley flood. With the exception of a small outbreak of meningitis in one of the concentration camps in Arkansas, there were no unusual epidemics of communicable disease as a result of the flood. The incidence of influenza and pneumonia was slightly above the expected incidence, but the same was true for most of the United States during the same period. About 166 persons were assigned to duty in the flood area to assist the state health departments in the work of rehabilitation. The incidence of communicable diseases among flood sufferers exceeded but little, if any, the normal expectancy.

Feb. 1, 1937, the office of industrial hygiene and sanitation investigations and the office of dermatoses investigations became the division of industrial hygiene of the National Institute of Health, to develop the means for the protection and improvement of the health of the working population. The report outlines studies of the problems involving the age of ganful workers, sickness among industrial workers and the results of the intraperitoneal injection of thirty-three dusts.

The gross amount of preventive vaccine manufactured for spotted fever was 591.2 liters, the largest quantity ever made. Rocky Mountain spotted fever was reported for the first time from four additional counties west of the Mississippi River: Liberty County, Texas; Faulk County, South Dakota; Logan County, Colorado; and Jackson County, Iowa.

Grants-in-aid to the forty-eight states, the territories of Hawaii and Alaska and the District of Columbia, totaled \$7,765,203.33. The sum available for these disbursements was \$8,881,859.21 including a balance of \$881,859.21 brought forward from the previous year. Of \$13,574,748 available to the service through appropriation and other sources, \$13,324,803 was expended for the fiscal year 1937.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan 1, 1938

The Introduction of New Remedies

At the Royal Society of Medicine, Dr J W Treven delivered his presidential address to the Section of Therapeutics and Pharmacology on the introduction of new remedies into clinical practice. He regarded the science of therapeutics as still in its infancy. What might be called the scientific era in therapeutics did not begin until the end of the eighteenth century. A curious fact was that in no case of which he was aware had a useful alkaloid been extracted from a plant from which some preparation had not been previously used therapeutically. In the eighties, the flood of synthetic or organic preparations began. The more modern developments might be divided into three groups: (1) those arising from working out the factor of immunity, (2) the development of endocrine and vitamin physiology and (3) the production by the organic chemist of synthetic remedies of all kinds.

A few dramatic recoveries after the administration of a new remedy were apt to make a physician think that he should treat every case with it. But a few apparent successes might be only a statistical accident. Insulin was an almost perfect example of how a new remedy should be introduced. The material was not set free as a commercial product until the most stringent clinical proof was obtained. It was perhaps too early to evaluate the sex hormones and preparations of the anterior pituitary, but the claims made for them antedated evidence of their special uses. The barbiturates were the happy hunting ground for the synthetic chemists but it was questionable whether a majority of these drugs had a sound scientific basis.

THE ADVERTISEMENT OF REMEDIES

The production and distribution of modern remedies were too often accompanied by advertising literature in which ancient superstitions were replaced by pseudoscientific jargon which was even worse. The medical profession was not sufficiently critical and perhaps got the advertising it deserved. In one leading journal he had tried to classify the advertisements of remedies. They numbered forty-three and from a lenient standpoint only twenty-seven could claim to have some foundation of laboratory or clinical fact, thirteen were untrue, misleading or simply silly, three he could not classify, as they appeared under proprietary names which gave no idea of their composition. In contrast he took *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*. It contained only thirteen advertisements of remedies, of which he would have rejected only one, and he was not sure about that one. He supposed that the welter of cult medicine in America made the profession examine its therapeutics with more care than was exercised in this country. New and Nonofficial Remedies of the American Medical Association was a valuable aid to the practitioner in providing some sort of criterion of the usefulness of a new remedy, and it would be well to have some such publication in England. Our provision for scientific work on the action of drugs should be greatly increased. For graduate education particularly a department in which the teacher provided a critical estimate of new drugs appearing should be established and as much time devoted to it as to the study of anatomy. Without some academic institutions outside commercialism treatment was likely to be swamped in this new era of therapeutics by a mass of good, bad and indifferent material provided by manufacturers. Their use of registered names should be given up entirely. A reprehensible practice

was the use of obscure and often slightly inaccurate chemical names hiding the fact that the preparation was an old drug masquerading as a new one. In the last few years there had been an improvement in the character of advertising, but much remained to be done.

Vaccination Against Asylum Dysentery

At a meeting of the Royal Medico-Psychological Association, Dr K C L Paddle reported the results of prophylactic vaccination against dysentery in the Caterham Hospital of the London County Council, which accommodates over 2,000 mental defectives. Dysentery due to Flexner's bacillus had been endemic there for many years. Since 1932 the practice had been to rely on isolation with inoculation of contacts and the results had been surprisingly good, though in 1931 dysentery was assuming epidemic form. The vaccine was made from cultures of *B. dysenteriae* (Flexner) of all types isolated from this and other London County Council mental hospitals. It contained 500 million organisms per cubic centimeter. A dose of 0.5 cc was given and was followed a week later by a second dose. There were no unpleasant reactions. Any case of dysentery occurring in a ward was classed as primary if it had not been preceded by another within sixteen weeks. Cases were regarded as secondary which followed a primary case within sixteen weeks. "Contacts" were patients in a ward in which a primary case occurred. The years between 1928 and 1931 were taken as a control period, in which thirty-one primary cases occurred, with 1,504 contacts. The years 1932 to 1936 were the inoculated period, in which twenty-nine primary cases occurred with 1,585 contacts. In the control period, forty-six contacts acquired dysentery (one in thirty-three), in the inoculated period, only sixteen (one in ninety-nine). Moreover, in the inoculated period nearly all the secondary cases occurred within sixteen days of the primary case, while in the control period many secondary cases occurred later. The value of inoculation was illustrated by a ward in which all contacts were inoculated after a primary case. No further cases occurred until the end of the eighth week, when another patient developed the disease. This at first looked like a failure of inoculation, but on inquiry it was found that this patient had been transferred from another ward and had not been inoculated at all. Further, the patient with the primary infection, now without symptoms, was found to be passing dysentery bacilli in large numbers. There was thus every opportunity for dissemination among the inoculated, but no one caught the disease.

Use of Oxford Medical School by Dominion Graduates

Lord Nuffield the automobile magnate whose recent gift of \$10,000,000 to the University of Oxford for the enlargement of the medical school was reported in *THE JOURNAL*, has now offered \$840,000 to provide more facilities for graduate students from South Africa, Australia and New Zealand to share the advantages of the school. During recent visits to those dominions he was impressed by the flourishing condition of their medical schools in spite of their remoteness from the great centers of research. It seemed to him that a scheme would be valuable which would provide easier access to the Oxford school for selected graduate students. He has offered to establish in Oxford three demonstratorships to be held in turn in the departments of anatomy, biochemistry, pathology, pharmacology and physiology, and three assistantships in the departments of medicine, surgery, obstetrics and gynecology, anesthetics, orthopedics and therapeutics. These posts will be tenable for a fixed period by graduates eligible for or already holding research posts in the universities or the dominions. The holders will be selected by these universities. They will enjoy all the advantages for the time, or becoming an integral part of the Oxford school. The scheme also contemplates the appointment from time to time by Oxford University, of a

visiting professor who would tour the dominions to give information with regard to research in Great Britain and to gain information as to the needs of the dominions

Cancer Research

In the annual report of the Imperial Cancer Research Fund, the director, Dr W E Gye, states that interest in the process of transplantation, once so keen, has waned, partly because of the rapid progress that has been made in the study of carcinogenic agents and viruses and partly because of the fact, understood more than twenty years ago, that though transplanted tumors afford material for the study of a cell already cancerous they give no clue regarding the remote causes of cancer. The term carcinogenesis is conveniently reserved for the starting of new tumors by the application of chemical or physical agents. The development of malignancy depends not only on the carcinogenic agent but also on intrinsic factors for which the vague term "susceptibility" is used. The methods of altering the susceptibility of an animal to the action of coal tar or the pure chemical compound benzpyrene has been a subject of research for some years. In 1936 and 1937 Dr Mary Gilmor, director of the Marie Curie Hospital Laboratories, worked in the laboratories of the fund to determine whether the ovarian hormone estrone can influence the susceptibility of mice to benzpyrene. It has been found that estrone increases the susceptibility of the skin of mice to the local carcinogenic action of benzpyrene. Dr Gye thinks that possibly the most important observation in cancer research during 1937 was made by the American geneticists Bittner and Little. Previously they proved that predisposition to cancer is not inherited according to simple mendelian formulas. In their recent experiments they have taken new-born mice of a high cancer strain and fostered them by mothers of a low strain and found the tumor incidence greatly reduced. Little carried the experiment farther by transferring tubal ova from high cancer strains to uteri of low strains. He found that in 100 cases no cancers occurred. On the other hand, Bittner and Little found that when new-born mice of a low cancer strain were fostered by mothers of high cancer strain the incidence of cancer increased. These experiments show that the problem of inheritance of mammary cancer is more complex than was formerly supposed. Besides inherited susceptibility there appears to be a maternal influence which may be in the mother's milk. Its nature—virus or chemical substance—remains to be discovered.

PARIS

(From Our Regular Correspondent)

Jan 1, 1938

Not a Happy New Year for the French Practitioner

Most of the medical journals here contain articles at the end of 1937 which picture the future in very somber colors. The social insurance authorities are in great measure responsible for this. First they have just established a new scale of remuneration for sickness claims. Although no change has been made in the amount of indemnity granted for services rendered at the office of the practitioner or in the domicile of the insured, they now indemnify the insured as much for services rendered by a dispensary, whether it is a private or public one. The result will be that instead of going directly to the office of a practitioner the insured will patronize the dispensaries. The objective of the insurance authorities is to force the profession to lower its fee table, which is already so low that the average practitioner can hardly pay his expenses. Another hard blow is that the minister of labor, whose department includes social insurance, has yielded to the demands of the Labor Federation so that all workers who earn less than

30,000 francs a year must now be covered by social insurance. The previous limit was 25,000 francs. This means that more of the working classes can take advantage of the reimbursement for sickness offered by social insurance with a corresponding decrease of the income of the practitioner, who is forced to accept the relatively low fee table of the social insurance organization. Another blow is that it has been found that the licensing authorities are granting the right to practice to a rapidly increasing number of foreigners without adequate inquiry into their fitness to practice. The French practitioner is not only obliged to pay an income and personal property tax but is also compelled to pay a "patente" or license tax for the privilege of practicing his profession. This tax, based on the rental value of the space used as offices, has always been a burden and the taxing authorities now threaten to increase this by 50 per cent. All in all, the practitioner's lot here is not happy, as he is caught between efforts to socialize medicine and the necessity of raising additional taxes every year.

Postoperative Pulmonary Complications in Children

As a rule, only general anesthesia can be employed for operations in infancy and childhood according to Dr Andre Martin, who presented his observations of pulmonary complications following more than 800 operations at the Oct 25, 1937, meeting of the Academie de chirurgie. No child should be operated on except in an emergency unless the temperature has been normal for forty-eight hours. If there is the least rise of temperature or signs of an acute infection of the upper respiratory tract, the operation should be postponed. The work of Duval and his associates, who have shown that the majority of postoperative pulmonary complications are of embolic causation, from toxic products formed at the site of operations, appears to be the best explanation of their origin. It is difficult to apply the same prophylactic postoperative treatment, such as inhalation of carbon dioxide and oxygen, to children as one uses for adults, hence an effort has been made to employ a pulmonary antiseptic postoperatively in the form of suppositories, for children. Martin was of the opinion that he had been able to avoid pulmonary complication in 817 consecutive operations on infants and children by giving a suppository containing the double sulfate of orthoxyquinoline and potassium combined with a creosote preparation. Such a suppository is given daily from four to seven days before and a limited number of days after the operation.

Symposium on Acute Articular Rheumatism

The entire Nov 26, 1937, meeting of the Societe medicale des hopitaux was devoted to the reading of a series of papers on acute articular rheumatism, or "maladie de Bouillaud," as it is termed in France. The first paper was by Debre and his associates, who reported a case of severe endomyocarditis associated with eruptions of a diffuse erythematous type and recurrent para articular nodules, in which an enlarged lymph node appeared which on biopsy revealed the presence of Streptococcus viridans in pure culture. In the discussion, Grenet stated that he had observed several cases of inguinal lymph node involvement in acute articular rheumatism.

The second paper, on clinical and therapeutic aspects, was by Lian and Facquet. They had seen several cases of acute arthritis follow a subcutaneous and tonsillar suppuration. In another patient the endocardial signs appeared about six months before the joint manifestations in an adolescent. Salicylates should be given in chronic valvular disease of the heart with or without decompensation only if there is reason to believe that it is on a rheumatic basis. Otherwise salicylates, because of the digestive disturbances to which they give rise, can do more harm than good. Salicylates are of much value in acute articular rheumatism but they appear to have no influence in

preventing valvular lesions. In the discussion Pichon said that the oral administration of the salicylates usually sufficed and intravenous injections ought to be employed only when the drug, given by mouth, was not tolerated. He believed that salicylates had a prophylactic influence on endocardial complications. Flandin was enthusiastic over the intravenous mode of administration of salicylates, having seen some excellent results in cases in which oral or subcutaneous administration was unsuccessful, even in large doses. Lesne was of the same opinion as Lian and Facquet as to the rare indication for giving salicylates intravenously but differed so far as the prophylactic action on the heart is concerned, believing that salicylates when given early enough and in adequately large doses can prevent cardiac complications. Lereboullet endorsed this latter observation but still gives preference to the oral route of administration except in severe chorea in children, in which the intravenous route gives more rapid results.

Benard and associates reported a case of acute articular rheumatism following an artificial pneumothorax insufflation for pulmonary tuberculosis.

Benda reported a case of acute infectious thyroiditis, which was evidently of rheumatismal origin, as all other causes could be excluded.

Laignel-Lavastine and his associates presented the history of a patient who showed marked mental disturbances, during acute articular rheumatism, in the form of a confusion syndrome. They had observed a number of similar subacute mental disorders which responded to treatment.

Codrell and his associates submitted their observations on 248 cases of acute articular rheumatism in soldiers. The majority occurred during the first four months of the year and in soldiers who had a history of similar attacks during childhood. Cardiac complications were found in only fifteen of the 248 cases, and these involved predominantly the aortic valve rather than the mitral, as generally believed.

Annual Meeting of French Orthopedic Society

The 1937 meeting of the French Orthopedic Society was held in Paris October 8, the principal two subjects to be discussed being tendon transplantations in paralytic foot deformities and bilateral coxalgia. A report on the former was read by Leveuf of Paris and Perrot of Geneva, who said that it was impossible to set a definite time limit as to when a muscle can be said to be paralyzed and that efforts to restore equilibrium should never be attempted until one is sure that the paralysis is established with certainty. Some muscles that appear paralyzed contract when placed under favorable conditions by elimination of bone deformity. This should always be done as a preliminary step unless the deformity is slight. Electrical examination of paralyzed muscles may lead to erroneous conclusions. It is better to examine their contraction by palpation or observing them when the child is asked to make movements entailing their use. Scherb of Zurich uses an apparatus resembling a moving sidewalk to note the degree of paralysis of a given muscle. As to technique, the authors advised transplantation of an entire muscle, avoiding tenotomy whenever possible. The tendon should be attached directly to the bone, the transplanted muscle being placed under slight tension and the leg immobilized in a plaster cast. Active movements should not be permitted for six or eight weeks. Details were given as to which muscles ought to be chosen to compensate for the paralyzed ones.

In the discussion, Froelich of Nancy stated that muscle transplantation for paralytic foot deformity could be successful only if three of the four groups of muscles that stabilize the foot were intact. Only *pes varus equinus* and *pes valgus* were amenable to transplantation. Paralyzed muscles can recover

their function as late as seven or eight years after the initial attack, hence an operation is never carried out at too late an interval.

The principal paper, on double coxalgia, was presented by Allard of Berck-Plage, the seaside resort for the treatment of tuberculous bone disease. The incidence of double coxalgia is from 6 to 8 per cent of all cases and the two sides are rarely involved simultaneously, the average interval varying from two months to two or three years. The prognosis is usually unfavorable, because a bilateral infection indicates the presence of a virulent tubercle bacillus. The mortality is between 10 and 12 per cent and even those who recover have marked deformity, so that walking is greatly interfered with. The treatment is the same as that given in unilateral cases.

In the discussion, Tavernier and Guilleret of Lyons said that they had observed only nine cases of bilateral coxalgia in a total of 284 cases. The prolonged clinical course with abscess and fistula formation was especially noticeable.

Andre Richard of Paris advised attempting the conservation of the mobility of at least one side. In cases of bilateral ankylosis, either a perthrochanteric osteotomy or a resection should be done.

The next meeting of the society will be held October 7 in Paris and the subjects chosen for discussion and special reports are osteoporoses and other diseases limited to the spine in adults and simultaneous fracture of the two bones of the forearm. The president for the coming year is Dr. H. L. Rocher of Bordeaux.

BELGIUM

(From Our Regular Correspondent)

Nov 10, 1937

Youth Hostels, Playgrounds, and the Ministry of Health

Profound changes have been effected in recent years in the public school system of Belgium. Although reform may not have been carried as far as the medical profession would have wished, substantial progress has been made. Much improvement has resulted from a general recognition of the fact that exercise in the open air forms a necessary, even a vital, part of any adequate program of physical education and hygiene for children and adolescents. The Ministry of Public Instruction itself has sought reforms in this direction, physical education programs of all sorts have been developed and a compulsory one hour period each week is now set aside for games and exercises in the open air.

Besides these official measures there is the work carried on by private organizations in the interest of an increase and development of outdoor activities for all the youth. Various philanthropic groups, religious, political and social, have been organized in Brussels as well as in the provinces, their work may thus far be said to present an extremely encouraging balance sheet.

There are in Belgium, as in most countries of Europe, several youth organizations with international affiliations, for example, such universally well known groups as the Boy Scouts and Girl Guides. In recent years real progress has been made in the establishment of wayside hostels for youthful tourists. These are of two sorts: the *auberges de jeunesse* (youth inns) open to all who request lodging and the *gites d'étapes* (night lodging places) restricted to youths who possess cards of introduction from a Roman Catholic Association. Both the non-Catholic and the Catholic hostels have been greatly developed in the course of the last year. Their purpose is to assure a decent, inexpensive night's lodging to youthful hikers and cyclists. Each hostel is in charge of a house father or house mother who meets the arriving guest, shows him to his quarters and acquaints him with the various facilities of which a

wary wayfarer may wish to make use (the house parent acts only as custodian and guide, each guest must wait on himself). The hostels are equipped with beds and blankets (rarely with bed linen), stoves, cooking utensils, lavatories and so on. The prototype of these hostels was founded in Germany in 1908. The first youth hostel in Belgium was opened in 1930 and at present there are thirty such establishments. The Catholics were able to realize a quite ambitious program in 1937, their Young Christian Workers' Organization, 150,000 strong, has opened sixty-one new hostels since January 1, and the Catholic League of Belgian Youth has established forty-one new hostels. During 1936 some 130 auberges de jeunesse provided nearly 150,000 night's lodgings to youthful tourists in Belgium.

In addition to the establishment of youth hostels, a great impetus has been given open air activities, properly speaking. A program for day pupils will differ from that suitable for boarding pupils. Camps and open air schools are designed for healthy or slightly debilitated children but not for abnormal or sick children. The camp colonies are open during vacation time, the open air schools the year round. Both camps and open air schools should be considered outdoor educational establishments for normal or nearly normal children and not as preventoriums or sanatoriums. In the words of Professor Lemonnier of Paris: "The open air school is above all a hygienic establishment for prophylaxis of illness and for recuperation. The academic curriculum of such a school is simplified and a rigid program of hygiene is enforced under medical supervision. The routine includes breathing exercises and corrective exercises, a well planned dietary, shower baths, siestas, rest cures and quiet hours. Classroom instruction is less extensive and more intensive, fewer books, fewer written exercises, much observation of speech, rigorous practice of hygiene."

Preventoriums are destined for pretuberculous children and accordingly should be classed among medical institutions. "The open air school, like the fresh air stations, is an establishment having a teacher at its head and a physician as a collaborator. The preventorium is an establishment having a physician as its head and a teacher as a collaborator." Day pupils may frequent the playgrounds both inside and outside the city as well as the fresh air stations. Playgrounds are tracts of land set aside for the organized play of school children in general. Fresh air stations are establishments for open air classes located on tracts of land outside the city. They are designed only for day pupils. Debilitated children in particular are sent to these so called temporary fresh air classes. The expansion of these open air facilities for children who reside at home is the most notable phase of recent educational reform in Belgium. Among the better organized of such facilities should be mentioned the fresh air stations directed by the Catholic Bureau of Hygiene and Welfare. This organization has extended its activities to an especially remarkable degree in the peripheral areas of Brussels thanks to the untiring efforts of Abbe Froiduc and Mlle Miette Fettweis.

A few figures illustrate the prodigious expansion of the bureaus program. In 1934, 1,200 children from twenty-seven schools attended the fresh air stations during the vacation months of July and August. In 1935 this number had quintupled, 35,000 children spent the summer days at the centers. In 1936 an attendance of 90,000 children was reported, in 1937 the attendance reached nearly 100,000. It is surprising that the necessary funds to finance such a vast development were forthcoming. The care of each child enrollee entails certain expenses: costs of transportation, general costs of providing two meals daily (this last varies according to location of the center, circumstances of kitchen, commissary, personnel and so on), besides expenses of supervision. The total per capita expenditure is five Belgian francs. The supervisory services of voluntary monitors of both sexes are furnished gratis. These

volunteers, young men and young women, who assist in this child welfare program by accompanying the various groups at the station proper or on the playground, are bound to receive valuable specialized experience, both technical and educational. For the training of the volunteer worker the Catholic Bureau of Hygiene and Welfare has organized regular courses in playground supervision. Both theoretical and practical courses are offered. In the former the student is instructed in the principles of physical education and hygiene, as well as in faith and morals, types of outdoor activity, the rationale of play, and so on. The practical courses consist of first hand observations of organized exercises and play, the student serves a probationary period and then takes an examination. The role of the monitor is of great importance in the general scheme of the program. A survey of similar programs as carried on in various European countries shows Belgium to have been behind-hand in recognition of the social value of the playground. Among the countries that have been more advanced in this direction are Germany, Czechoslovakia, Switzerland, Rumania and Italy.

In all lands the youth organization forms a most important mechanism in the civic orientation of the child. All the mentioned countries practice the education of the child in hygienic principles by an appeal to the play instinct. The Red Cross often collaborates in this work. In the same way the child receives a civic education through the simple instruction and daily repetition. Personal and social discipline and a sense of responsibility are thus acquired early in life. Favorable results are more readily obtained in the pleasant atmosphere of the playground than in the school proper. Accordingly an improvement in the child's daily surroundings would seem to be the reform most needed in present-day Belgium.

At the present time, when the success of fresh air stations has been noteworthy and when the united efforts of so many groups, private, sectarian, political, social, have supported this program of expansion, should not the Ministry of Health consider the employment of this truly marvelous educational adjunct in the formation of the child's civic consciousness and the inculcation of that excellent Anglo-Saxon maxim "Let your conscience be your guide!" For it should be mentioned that a short time ago the Ministry of Health assumed control over all organized outdoor educational activities and has instituted a national survey of playgrounds with a view to reorganization.

There are at present some fifty playgrounds connected with communal schools or communes and another fifty controlled by private organizations. These figures reflect the need for a more intensive propaganda, as this number is obviously inadequate for a populous country like Belgium. It is to be expected that the efforts of the Ministry of Health will lead to notable results and that important subsidies will henceforward be granted to both publicly and privately organized playgrounds, subject to strict medical surveillance.

Pollution of Waterways

A recent royal decree is directed against the pollution of Belgian waterways by the residual waters from breweries and distilleries. These polluted waters must not be discharged into waterways, either open or enclosed unless the following requirements have been satisfied: 1 The effluvia of filtrated residual waters must not contain more than 30 mg per liter of matter in suspension. 2 Effluvia that is unfiltered, undiluted and kept at a temperature of 20 C must not absorb in five days' time more than 100 mg of oxygen per liter. 3 The effluvia must not contain any substance capable of poisoning the fish or the animals that drink from the stream nor must it exert any unfavorable influence on the biologic capacity of the natural waters of a stream. 4 Residual waters showing a temperature in excess of 25 C must not be released.

Abner Wellborn Calhoun ☉ Atlanta, Ga., Harvard University Medical School, Boston, 1923, associate in medicine at the Emory University School of Medicine, assistant visiting physician to the University Hospital, aged 40, died, Nov. 3, 1937, of coronary occlusion.

Charles Brooks Jones, Quanah, Texas, University of Louisville (Ky.) Medical Department, 1912, member of the State Medical Association of Texas, served during the World War, county health officer, aged 52, died suddenly, Oct. 7, 1937, of angina pectoris.

William Metcalfe Stone ☉ Flushing, N. Y., New York University Medical College, New York, 1897, chairman of the executive committee of the staff Flushing Hospital and Dispensary, aged 66, died, Oct. 29, 1937, in the Presbyterian Hospital, New York.

Lewis Sage Hardin ☉ Atlanta, Ga., Southern Medical College, Atlanta, 1898, fellow of the American College of Surgeons, surgeon to St. Joseph's Infirmary and visiting surgeon to the Georgia Baptist Hospital, aged 64, died, Nov. 12, 1937.

Daniel Webster Zirker ☉ Merced, Calif., Cooper Medical College, San Francisco, 1908, served during the World War, past president of the Merced County Medical Society, aged 52, on the staff of the Mercy Hospital, where he died, Oct. 25, 1937.

Francis Fremont Whittier, Brookline, Mass., Dartmouth Medical School, Hanover, N. H., 1884, member of the Massachusetts Medical Society, founder of the New England Baptist Hospital, Boston, aged 85, died, Oct. 6, 1937, in Worcester.

Frank A. Fuller, Jacksonville, Texas, Missouri Medical College, St. Louis, 1880, member of the State Medical Association of Texas, on the staff of the Nan Travis Memorial Hospital, aged 78, died, Oct. 11, 1937, of coronary occlusion.

William Joseph Carter ☉ Mattoon, Ill., St. Louis University School of Medicine, 1905, fellow of the American College of Surgeons on the staff of the Methodist Memorial Hospital, aged 61, died, Nov. 23, 1937, of angina pectoris.

John Humphrey Johnson, Cardiff, Md., University of the City of New York Medical Department, 1879, formerly member of the state legislature of Montana, aged 86, died Nov. 10, 1937, of organic heart disease and gangrene of the foot.

Charles Forrest Perkins, Wickenburg, Ariz., Rush Medical College, Chicago, 1886, fellow of the American College of Surgeons, aged 75, died, Oct. 21, 1937, in a hospital at Phoenix, of hypertension and dilatation of the heart.

Clyde Roscoe McKinniss ☉ Blairsville, Pa., Medical College of Ohio, Cincinnati, 1903, member of the American Psychiatric Association, formerly superintendent of the Torrance (Pa.) Hospital, aged 61, died, Oct. 30, 1937.

Herman Robert Baumgarth ☉ Chicago, Wisconsin College of Physicians and Surgeons, Milwaukee, 1898, aged 69 on the staff of the Lutheran Deaconess Hospital, where he died, Nov. 12, 1937, of arteriosclerosis and hypertension.

Charles S. Brannan, Albion, Ill., Rush Medical College, Chicago, 1897, member of the Illinois State Medical Society, aged 70, died, Nov. 8, 1937, in the Welborn-Walker Hospital, Evansville, Ind., following an operation for hernia.

Franklin Callender Jessup ☉ Chicago, Chicago Medical School, 1922, aged 55, died, Nov. 19, 1937, in the Post Graduate Hospital and Medical School, of cardiovascular renal disease and injuries received in an automobile accident.

James M. Barnette, Osahoma, Miss., Memphis (Tenn.) Hospital Medical College, 1903, member of the Mississippi State Medical Association, aged 61, died, Nov. 7, 1937, in the Jackson (Miss.) Infirmary, of heart disease.

Charles Slicer Groseclose, Buena Vista, Va., University of Virginia Department of Medicine Charlottesville, 1929, member of the Medical Society of Virginia, aged 33, died, Nov. 8, 1937, in a hospital at Radford.

John Frank Taylor ☉ Hamlin, Texas, Vanderbilt University School of Medicine, Nashville, Tenn., 1901, formerly mayor, chairman of the school board and health officer, aged 66, died Oct. 18, 1937, of heart disease.

Edwin Frank Kehr ☉ Pasadena, Calif., Johns Hopkins University School of Medicine, Baltimore, 1930, secretary of the Monterey County Medical Society, aged 32, died suddenly, Nov. 1, 1937, of heart disease.

John Ingram Barron ☉ York, S. C., University of Maryland School of Medicine, Baltimore, 1901, secretary of the York County Medical Society, served during the World War, aged 62, died, Oct. 23, 1937.

Mark Russell Braswell, Rocky Mount, N. C., University of Maryland School of Medicine, Baltimore, 1886, aged 72

died, Nov. 15, 1937, in the Stuart Circle Hospital, Richmond, Va., of cerebral hemorrhage.

William M. Shipley, Ottosen, Iowa, Drake University Medical Department, Des Moines, 1898, past president of the Twin Lakes District Medical Society, aged 64, died, Oct. 30, 1937, of aplastic anemia.

Charles A. Holland, Berlin, Md., Southern Homeopathic Medical College, Baltimore, 1904, member of the Medical and Surgical Faculty of Maryland, aged 60, died, Nov. 19, 1937, of cerebral hemorrhage.

Donza Clarence Casto, Parkersburg, W. Va., Baltimore Medical College, 1899, member of the West Virginia State Medical Association, aged 60, died, Oct. 24, 1937, of hypertension and nephritis.

William Meredith Anderson, Los Angeles, University Medical College of Kansas City, Mo., 1908, veteran of the Spanish-American War, aged 59, died, Nov. 15, 1937, of coronary thrombosis.

Charles E. Hardin, Flat Rock, Ill., Barnes Medical College, St. Louis, 1904, member of the Illinois State Medical Society, aged 58, died, Nov. 9, 1937, of carcinoma of the sigmoid and rectum.

James Sager Threlkeld, New York, University and Bellevue Hospital Medical College, New York, 1922, member of the Medical Society of the State of New York, aged 39, died, Oct. 9, 1937.

George Kenniston Blair ☉ Salem, Mass., Medical School of Maine, Portland, 1900, formerly member of the school board, aged 62, on the staff of the Salem Hospital, where he died, Nov. 3, 1937.

Lorena M. Breed, Pasadena, Calif., Northwestern University Woman's Medical School, Chicago, 1893, fellow of the American College of Physicians, aged 74, died, Oct. 20, 1937, in a local hospital.

Christian Benjamin von Scheele, Jacksonville, Ohio, Ohio Medical University, Columbus, 1901, for many years a member of the local board of education, aged 75, died, Oct. 27, 1937, of senility.

Edward Austin Andrews ☉ Newton, Mass., Harvard University Medical School, Boston, 1896, aged 66, for many years on the staff of the Newton Hospital, where he died, Nov. 8, 1937.

Frederic Wade Hitchings ☉ Cleveland, Harvard University Medical School, Boston, 1905, aged 58, died, Nov. 12, 1937, in the Lakeside Hospital, of bronchiopneumonia and cholecystitis.

Colin Campbell Brymer, Arundel, Que., Canada, University of Bishop College Faculty of Medicine, Montreal, 1895, L.S.A. London, 1897, aged 71, died, Oct. 2, 1937, of coronary embolism.

Richard Taylor Anderson, Louisville, Ky., University of Louisville Medical Department, 1902, served during the World War, aged 57, died, Nov. 10, 1937, of hypertensive heart disease.

Edwin Olin Hentz, Newberry, S. C., Medical College of the State of South Carolina, Charleston, 1889, member of the South Carolina Medical Association, aged 73, died Nov. 5, 1937.

Elmer R. Porter, Los Angeles, University of Nebraska College of Medicine, Omaha, 1898, aged 66, died Oct. 18, 1937, in the Hospital of the Good Samaritan, of arteriosclerosis.

J. Wilson Loughry ☉ Cincinnati, Medical College of Ohio, Cincinnati, 1901, aged 63, on the staff of the Deaconess Hospital, where he died, Oct. 26, 1937, of coronary embolism.

Barrett Dedrick Bice, Sparks, Nev., Jefferson Medical College of Philadelphia, 1902, served during the World War, aged 59, died Nov. 10, 1937, of chronic myocarditis.

Herschel Curry Milburn, Ville Platte, La., University of Louisiana Medical Department, New Orleans, 1883, aged 76, died Oct. 28, 1937, of cerebral hemorrhage.

Alfred John Klint, Minneapolis, Milwaukee Medical College, 1912, aged 57, died, Oct. 26, 1937, in the Northwestern Hospital, of pleurisy with effusion.

Amos Joseph Thornber ☉ Burlington, Iowa, Keokuk Medical College, 1896, aged 68, died, Oct. 24, 1937, of pulmonary embolism.

Harrison Dellinger Rank, Newark, Ohio, Miami Medical College, Cincinnati, 1903, aged 64, died Oct. 24, 1937, of heart disease.

John E. Burby, Peoria, Ill., Baltimore Medical College, 1895, aged 67, died, Nov. 9, 1937, of cerebral hemorrhage.

Correspondence

CORRECTION—REACTIONS TO FEVER THERAPY

To the Editor—In THE JOURNAL, May 18, 1935, page 1779, appeared an article, "Fever Therapy Results for Gonorrheal Arthritis, Chronic Infectious (Atrophic) Arthritis, and Other Forms of 'Rheumatism,'" written by me with Charles H. Slocumb and Walter C. Popp. On page 1787 (reprint page 25) under the heading "Physiologic Reactions to Fever Therapy" appeared this statement: "In about 3 per cent of cases, protracted anorexia and nausea and frequent vomiting may be encountered for from twenty-four to forty-eight hours, but this condition can be promptly overcome by the intravenous administration of from 500 to 1,000 cc. of 10 per cent dextrose and 10 per cent saline solution." The proper concentration of the latter solution was incorrectly stated and should of course have read 10 per cent saline solution. The stenographic error was unfortunately not noted in subsequent manuscript and proof readings. A London correspondent has called my attention to the error and has stated that the paper is still frequently referred to and quoted in England, and correction therefore seems desirable even at this late date.

PHILIP S. HENCH, M.D., Rochester, Minn.

PROPRIETARY BISMUTH-IODINE PRODUCTS FOR ORAL USE IN ANTI-SYPHILITIC TREATMENT

To the Editor—Recently it was brought to my attention that two proprietary bismuth-iodine products are being distributed to the medical profession for oral use in the treatment of syphilis. These two products are Bismuth-Iodine Compound distributed by S. E. Massengill Company, Bristol, Tenn., and Bisiodide, distributed by Salb Laboratories, Inc., Seymour, Ind. Neither one of these products stands accepted by the Council on Pharmacy and Chemistry.

Since our department has done considerable work with bismuth for oral use and with a bismuth-iodine complex (iodobismutol), we were interested in determining whether gastro-intestinal absorption of bismuth could be demonstrated with these products. Adequate absorption of bismuth is, of course, an indispensable requirement for antisyphilitic treatment. We learned several years ago that sodium iodobismuthite, the soluble bismuth-iodine complex in iodobismutol, was not absorbed from the alimentary canal of animals given liberal gastric doses because this complex is hydrolyzed and the bismuth rendered insoluble in the intestine. No bismuth was excreted in the urine. This is practically true for all bismuth compounds in current use. Therefore the positive claims for oral Bismuth-Iodine (Massengill) and Bisiodide (Salb) seemed incredible to us, unless, after all, these were unusual bismuth-iodine complexes.

Therefore supplies of the two products were obtained directly from the two manufacturers, and with the assistance of Dr. Walton Van Winkle, Jr., I proceeded to make tests with each on members of the laboratory personnel. Bismuth-Iodine Compound (Massengill) was found to be a nearly tasteless and highly insoluble bright red product in capsules. The composition given on the label was as follows: Each capsule contains 4 grs. of a complex organic compound containing approximately 22% of Bismuth and 54% of Iodine. The composition of Bisiodide capsules stated on the label was as follows: "0.25 Gm. (3.85 grs.) represents metallic bismuth 24.26%." This was also a nearly tasteless and highly insoluble product but possessed a dusky red color. From the general appearance and composition, both products resembled iodobismuthite, but the cation (basic ion) could not have been sodium or potassium, because this would make the products soluble. We did not attempt to

identify the cation, but this might have been some organic radical, or an alkaloid like quinine, which produces relatively insoluble iodobismuthites. Heating the products with hydrochloric acid solution, or with propylene glycol, resulted in red solutions, which promptly precipitated on dilution with an excess of water. The precipitated material was the pale yellowish bismuth oxyiodide, the typical hydrolytic product obtainable from any iodobismuthite. Hydrogen sulfide water gave a black precipitate of bismuth sulfide with both solutions and iodine was liberated after addition of nitrite and sulfuric acid. In other words, both products contained bismuth and iodine in the form of some iodobismuthite.

Three men took the products by mouth on two separate occasions. Each man took six capsules (about 15 Gm. [0.33-0.35 Gm. Bi]), which represented the maximum daily doses recommended on the labels. Urine was collected for from twenty-four to twenty-eight hours, generally as specimens at eight hour intervals. Analyses for bismuth in all specimens were made by a long accurate method (Lehman, A. J., Richardson, A. P., and Hanzlik, P. J. *J. Lab. & Clin. Med.* 21:95 [Oct.] 1935) and by a short clinical method (Hanzlik, P. J., Lehman, A. J., Richardson, A. P., and Van Winkle, W., Jr. *Arch. Dermat. & Syph.* 36:725 [Oct.] 1937). However, not one specimen of urine at any time contained a demonstrable trace of bismuth! All specimens contained liberal amounts of iodine, as indicated by strong positive tests with sodium nitrite, sulfuric acid and chloroform (violet color). These negative results for bismuth, of course, confirmed our expectations, as well as our former experience with sodium iodobismuthite, when administered gastrically. Gastro-intestinal absorption of iodide would be expected after hydrolysis of iodobismuthite in the alimentary canal because one of the products formed under these conditions is an iodide.

On the other hand, the same persons showed bismuth in the urine half an hour after taking 0.4 or 0.6 Gm. of sobismutol (0.28 or 0.42 Gm. Bi) under the same conditions (Hanzlik, Lehman, Richardson and Van Winkle *Arch. Dermat. & Syph.* 36:708 [Oct.] 1937), gastro-intestinal absorption having been confirmed in many other experiments.

Here then are two semisecret, unaccepted, proprietary products of bismuth and iodine being exploited for oral treatment of syphilis, but without the possibility of systemic action of bismuth, since the bismuth in this form is not absorbable. Any antisyphilitic effects would depend on uncertain quantities of iodide liberated in the alimentary canal. However, this is an unwarranted procedure for exhibiting iodide even in tertiary syphilis.

But the claims of the manufacturers go further. For instance the following statement appears on the label of the Massengill product: "For the oral treatment of syphilis replacing the intramuscular injections of bismuth or its compounds." The label on the Salb product states: "For oral administration. Having the property of penetrating the brain and cerebrospinal fluid." Neither statement is supported by evidence, nor in our opinion can the claims be correct for the reasons given.

The exploitation of these two worthless bismuth products for oral treatment of such a serious disease as syphilis appears most reprehensible, if not criminal. Be it noted that one of these manufacturers was responsible for the notorious "elmir" of sulfanilamide. The shock of seventy-three martyrs to the incompetent proprietary interests is still fresh in our minds. Consider now the possibility of a Roman holiday with hundreds, if not thousands, of innocent persons to be victimized with these oral bismuth products for syphilis. Could there be a stronger argument for strengthening government control of irresponsible, mercenary interests trafficking in the health of the people? Ironically enough, the public is being outraged just when the U. S. Public Health Service is exerting every ounce of effort, and spending large public funds, to curb the spread of syphilis. In matters of treatment, physicians, above

all others, have definite and inescapable responsibilities to their syphilitic patients they should not use unaccepted and unproved antisiphilitic remedies

P J HANZLIK, M.D., San Francisco

[NOTE—Another product not mentioned by Dr Hanzlik is Orblmin "Organic Bismuth and Iodide administered orally in the Treatment of Syphilis," sold by the Central Pharmacal Company of Seymour, Ind. Oscar G. Salb of Salb Laboratories appears to have been chief research chemist for the Central Pharmacal Company before he started his own firm.—Ed.]

Queries and Minor Notes

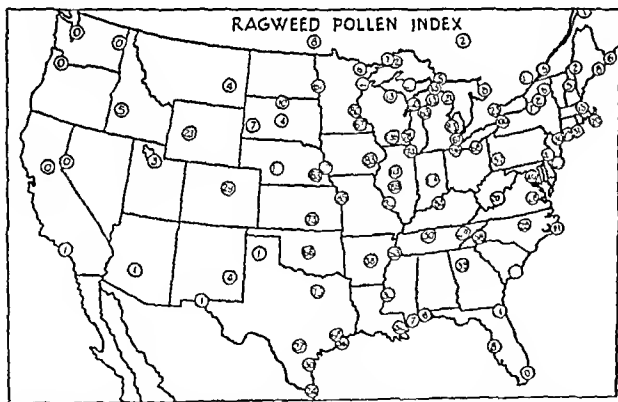
THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

RAGWEED POLLEN DISTRIBUTION

To the Editor—Where can I obtain information regarding the distribution of giant and dwarf ragweed in the United States and Canada? I have access to some of the older maps showing this distribution but desire the latest information.

M D Illinois

ANSWER—Critical botanical descriptions of nearly 100 American species of ragweed and some general information on the geographic distribution of each will be found in Rydberg's "North American Flora." One practical difficulty in using this textbook is that no popular names are given. The reader must decide for himself which of some twenty species of *Ambrosia* described are distinct and important, and whether the term "dwarf ragweed" (understood by allergists as synonymous with "common ragweed" and "short ragweed") shall apply to some one of nine species of low growing, ragged leaved annual ragweeds or to the group as a whole. Distinctions between the members of the group are closely drawn and are not accepted by all botanical authorities. Allergists are probably justified in disregarding all these distinctions, at least those made for *Ambrosia elatior* L., *Ambrosia artemisia* L. and *Ambrosia*



The figures are based on both length of season and degree of atmospheric contamination. The larger the figure the greater the exposure of those who are highly sensitive.

monophylla (Walt.) Rydberg. There is even good botanical authority for this view (Britton and Brown). No evidence exists of any difference in the antigenic element in their pollens. Allergists have made a similar merger between the two very similar forms of giant ragweed, *Ambrosia trifida* L. and *Ambrosia aptera* L., so that the latter is regarded as an unimportant variety of the former.

Both common ragweed and giant ragweed are abundant in the agricultural areas of the Central Southern and Eastern states. The former is more adaptable than the latter and will flourish with less moisture. Giant ragweed is infrequent or absent from Florida, upper New England, and eastern Canada. In the dried parts of the great plains and throughout the Rocky Mountain district these ragweeds are replaced by western ragweed which, being a perennial, is able to thrive on small amounts of moisture.

For diagnosing and treating hay fever, the quantitative distribution of ragweed pollen is of more interest than field aspects of weed distribution. Durham's uniform studies on the atmospheric distribution of ragweed pollen, carried on with the cooperation of the United States and Canadian weather bureau, since 1929, are not confined strictly to common ragweed and giant ragweed, as his figures include western ragweed (*Anibrosia psilostachya*) and southern ragweed (*Ambrosia bidentata*), also related genera such as *Iva* (marsh elder), *Cyclachnen* (burweed marsh elder or prairie ragweed), *Xanthium* (cocklebur) and *Franseria* (false ragweed). However, in most sections of central and eastern North America common ragweed and giant ragweed furnish the greater part of the pollen, which he counts as "ragweed." His latest revised "ragweed index map" is shown.

Following are recent articles and summaries:

- Rydberg P. A. North American Flora. New York: the New York Botanical Garden, 1922.
- Britton N. L. and Brown A. Illustrated Flora of the Northern United States, Canada and the British Possessions. New York: Charles Scribner's Sons, 1913.
- Feinberg S. M. Allergy in General Practice. Philadelphia, Lea & Febiger, 1934, pp. 184-235.
- Durham O. C. The Pollen Content of the Air in North America. *J. Allergy* 6: 128 (Jan.) 1935.
- Durham O. C. Evaluation of the Hay Fever Resort Areas of North America. *ibid* 8: 175 (Jan.) 1937.

POISONING FROM TUNG OIL

To the Editor—A few weeks ago I had a case of poisoning caused from eating the berry from a tung oil plant. There was a great deal of pain for several hours. A number of these trees grow in Opelousas and I should like to have the antidote in case of a recurrence. I understand that the fruit of this tree is poisonous and several cases of livestock deaths have been reported from eating of it. I would appreciate what ever information is available.

A. J. BOUDREAU, PH. G., Opelousas, La.

ANSWER—There is a wide discrepancy in the reports of the toxic properties of the substances derived from the many varieties of Chinawood trees. Two types of injury are widely recognized, direct chemical irritation to the skin and inflammation of the intestinal tract, leading to severe vomiting and purging.

It is believed that skin lesions will readily disappear following removal from further contact, and in the presence of any of the usual bland treatments for chemical dermatoses. In fact, Wolff in 1913 noted that Chinawood oil is itself used in skin diseases and also as an insecticide and fumigant. According to the U. S. Dispensary, edition 22, it has been used in ulcerations and skin diseases. Hertkorn (*Chem. Ztg.* 27: 635, 1903) reported, on the other hand, that the seed kernels of the fruit of this tree are highly toxic and that its oil produces violent skin inflammation. Chinawood oil is used in the paint industry extensively, and it has been reported that it is occasionally found to be a source of dermatitis and that sensitizations have occurred, usually in the form of dermatitis.

With regard to the toxicity of the berries when ingested, there is much confusion in the literature. Subsequent to the first introduction of these trees to the Southern states in 1905, children used green Chinawood tree berries as ammunition in toy pop guns made from elder. The children were wont to chew either the green or ripe berries of this particular variety of Chinawood tree without any reported ill effects. It is not known whether these southern trees are *Aleurites cordata* or *Aleurites fordii*, but their berries are usually considered distasteful, although not poisonous. However, it has been stated that there are a number of trees of the *Aleurites fordii* species in Audubon Park, New Orleans, and that the park superintendent has eaten the nut or berry without ill effects, as is true for another person to whom he has given this fruit. Contrariwise, it is reported from California that the berries of the trees there have made persons desperately ill through the purgative constituent which they are said to contain. According to the Bulletin of the Imperial Institute in London both fruit and seeds cause severe vomiting and purging in man. The U. S. Dispensary, edition 22, states that the seeds of the tung tree (*Aleurites cordata*) are used in China for killing rats and are also reputed to have emetic properties. Thus some species of the trees apparently yield toxic constituents while others do not.

In the case of ingestion of berries, gastric lavage has been recommended if the condition is detected early; otherwise the treatment should be as for any other violently acting irritant to the intestinal tract such as croton oil. It has been stated that a home remedy for the dermatitis produced in the South consists of boiling up quantities of pine shavings in water and applying the resinous extract to the parts affected. While this remedy might have some value, undoubtedly there are others with greater efficacy.

Of interest at the present time is the fact that warfare in China is cutting off heavy shipments of tung oil (from China-wood trees) to this country and thus focusing attention both on substitutes for tung oil and on possible sources of supply of tung oil from American plantings

POSSIBLE VULVAL DERMATITIS FROM CONDOM

To the Editor—A white married woman aged 26 has complained of itching around the vulva for three weeks. The onset was sudden. The first complaints were of a feeling of warmth and itching. To a lesser extent itching was noted around the anus. There was a marked erythema around the vulva. In several days the erythema spread down to the thighs accompanied by a feeling of warmth and itching. For several days there was moderate edema of the vulva which was relieved by applications of ice. Ten days after the onset vesicles were noted along the vulva. The gynecologic examination revealed no abnormality in the genital organs. Smears from the vagina revealed no trichomonads or gram-negative diplococci. The laboratory reported gram-positive diplococci. The Wassermann reaction is negative. Blood sugar is 133 mg. The urine is negative for sugar and albumin. The urine is highly acid. The sedimentation rate is increased. At present the erythema on the thighs is decreasing the edema has disappeared and there is a slight erythema around the vulva. The itching though present has decreased. The patient had a similar episode one year ago which lasted for about three months. She believes that she may be sensitive to certain brands of condom for the first attack followed a change in brand and the latter attack followed the use of a condom after an interval of months during which a diaphragm and jelly were used. Have such cases of sensitivity to a condom with resultant inflammation been reported? Are the gram-positive diplococci a factor? How should one evaluate the highly acid urine? What is the treatment? Washes, douches and lotions and but little.

M D North Carolina

ANSWER—The supposition that a special brand of condom may be the responsible factor in the condition described is probably correct. There are no reported cases proving the relationship between condoms and afflictions of the skin on the vulva or around the anus. However, Rattner (*THE JOURNAL*, Oct 12, 1935, p 1189) reported a case of dermatitis of the penis from the use of rubber condoms. This patient had been treated for seven months for attacks of balanitis and non-gonorrheal urethritis. When first seen by Rattner the lesions of the skin had the characteristics of an "irritant dermatitis." To confirm the impression that the condoms used by the man were responsible for the condition, a patch test was performed. A piece of the rubber, moistened, was strapped to the inner surface of the patient's arm and within twenty-four hours a patch of vesicular dermatitis developed similar to that on the penis. Rattner mentions that Obermayer reported a similar case. The latter found the irritant factor to be a compound that could be rendered nonirritant by treatment with alkali. Rattner's patient also could render the rubber nonirritating by treating it with 5 per cent solution of sodium hydroxide.

Neither the gram-positive diplococci nor the highly acid urine have any significance in the causation of the eruption. Smears should be made to see whether yeast is present in the vagina.

In this case condoms should not be used, at least for a few weeks. A patch test as described should be carried out. If it is positive, condoms should not be used at all or only after treatment with an alkali. Even if the patch test is negative, condoms may still be the responsible factor in the patient's condition, because the friction of the rubber against the skin and mucous membrane may produce an irritation. Hence a skin eruption may be brought about by physical means as well as by chemical or allergic means. While attempts are being made to find out the actual cause of the patient's affliction, soothing ointments should be used.

VINCENT'S INFECTION OF MOUTH

To the Editor—What is the best treatment for chronic Vincent's infection of the mouth? The patient has had many treatments including Tilton's solution, chromic acid, ten injections of neoarsphenamine intravenously, liver extract and ultraviolet rays locally without material improvement.

M D New Jersey

ANSWER—The etiologic factor is a symbiotic combination of anaerobic or aerobic organisms, with spirochetes and fusiform bacilli present in great numbers. Probably the best treatment is the use of oxygen-freeing agents, such as hydrogen peroxide and sodium perborate. Severe cases have been cleared up in from twenty-four to forty-eight hours by hospitalizing and carrying out treatment every fifteen minutes. More recently the use of antispirochetal therapy such as neoarsphenamine has been advised and good results have been reported. In most cases the use of the antispirochetal remedies has been accompanied by prophylactic methods and it is sometimes difficult to decide to which therapy the result is to be assigned.

It has been recognized that exposure, exhaustion, unsanitary conditions, malnutrition and debility are accessory causes which

account for the frequency of the condition among soldiers, hence the name of "trench mouth" for the disease.

Because of the appearance in smears from chronically diseased gums and periodontal membranes of spirochetes and fusiform bacilli, many men have considered that there is a chronic form of Vincent's infection. This view has been strengthened by the fact that at least some of these conditions seem to improve under antispirochetal therapy. Some, in fact seriously question the etiologic relation of the spirochete and fusiform bacillus to the chronic condition. The fact that in this case neoarsphenamine has not been effective would strongly indicate that the condition is not Vincent's infection but is caused by some other etiologic factor. The determination of the cause of chronic inflammations of the gums and periodontal membranes is a difficult problem and requires the services of a well trained dentist.

DIATHERMY IN PROSTATITIS

To the Editor—Please explain the supposed action of diathermy on the prostate as administered with an electrode in the rectum. Has it been scientifically proved that the high temperature penetrates or goes through the gland or is it mainly surface heat? If surface heat is diathermy any more valuable than the old thermophore or the electrically heated electrode? Has any investigation or thought been given to the possibility that the frequent instrumentation and high temperature to which the rectum is subjected may eventually be a cause of an increase in rectal carcinomas? Has it been generally accepted that prostatic massage is useless and possibly harmful? There seems to be propaganda to that effect maybe our friend Brinkley and his broadcasts have started the vogue. The chiropractors and cults are doing a land office business with diathermy for the prostate and no massage. If they are correct more power to them. I will appreciate an answer to these questions as the present knowledge available seems to be furnished by high powered salesmen.

M D Michigan

ANSWER—It has always been supposed that the action of diathermy on the prostate as administered with an electrode in the rectum was brought about by penetration of the high temperature. It has not been scientifically proved that such occurs, and it has always been felt that hot rectal irrigations and warm sitz baths were of more value, less expensive and certainly less troublesome to the patient. Prostatic massage still remains the treatment of choice, and its value is well established in spite of the propaganda of the many cultists broadcasting over the radio. In the true inflammatory prostatitis emptying of the prostatic ducts by means of massage is helpful, and it is absolutely necessary if the improvement is to be made in the infectious process. Owing to frequent difficulty in drainage of the prostate with blocking of the small ducts by clumps of pus cells, local heat is not sufficient. Mechanical emptying of the ducts by means of massage is necessary and there is no actual case record proving it at all harmful. It certainly does not lead to rectal or prostatic carcinoma.

TRYPTOPHAN TEST FOR TUBERCULOUS MENINGITIS

To the Editor—Have you available any recent evaluations of the tryptophan test on cerebrospinal fluid especially with regard to its specificity in the diagnosis of tuberculous meningitis? I have used this test occasionally in the past but no longer remember the precise technique and should therefore appreciate a detailed account of the procedure.

S MILES BOUTON JR M D Ingleside Neb

ANSWER—Tryptophan bodies have been said to exist in the spinal fluid of patients with tuberculous meningitis. It has been suggested that the tryptophan is synthesized by the tubercle bacillus in the spinal fluid. The difficulty encountered in demonstrating the tubercle bacillus in the spinal fluid is the reason for using the tryptophan test. Many authors report 100 per cent positive results on all cases of tuberculous meningitis but others have reported failures.

Three reagents are required

- 1 Concentrated hydrochloric acid
- 2 Formaldehyde, 2 per cent aqueous solution, prepared fresh daily by making a 1:20 dilution of the stock 40 per cent solution of formaldehyde
- 3 Sodium nitrite, 0.06 per cent aqueous solution, a 0.6 per cent stock solution should be made weekly and from this a dilution of 1:10 made at the time of the examination

Three cubic centimeters of cerebral spinal fluid is placed in a test tube and to this is added 15 cc of concentrated hydrochloric acid and two or three drops of the 2 per cent formaldehyde solution. Shake and allow to stand for five minutes.

Gently float on 2 cc of the 0.06 per cent sodium nitrite solution and allow to stand. A positive reaction appears in two or three minutes as a delicate violet ring at the junction of the floating sodium nitrite solution with the subjacent fluid and persists for from fifteen to thirty minutes or more.

The reaction is negative if no change occurs or only a slight yellowish ring appears at the junction. The reaction is best

observed by daylight against a white background. The intensity of the reaction is in some measure quantitative, the more advanced the case, the more definite the color change. The false positive reaction, which is obtained in purulent, hemorrhagic or xanthochromic fluids irrespective of their cause, appears as a purplish ring at the fluid junction, deeper in color, thicker and more easily seen than the true reaction, and in many cases diffusing into the fluids both above and below. Since the spinal fluid in tuberculous meningitis is usually clear, the test is not invalidated. The whole test may be performed in twenty minutes.

FROGS IN PREGNANCY TEST

To the Editor—Please give me any available information on the use of frogs to determine pregnancy. Please give references.

ADOLPH S. WILLMAN, M.D., Brooklyn

ANSWER—This test, advocated by Konsuloff, depends on a color reaction in hypophysectomized frogs. Hypophysectomy causes the skin of the frog to lose color and become very light. Injection of urine from a pregnant woman into the lymph sac of a frog produces, within one to two hours, a black pigmentation of the skin. This is caused by the action of the melanophore principle eliminated in the urine of the pregnant woman, which stimulates a diffusion of pigment into the frog's skin. According to Konsuloff the results of this test are 100 per cent accurate.

Bruhl and Rieckhoff (*Ztschr. f. Geburtsh. u. Gynak.* 112:1 [Dec.] 1935) attempted to repeat this work and found that of twenty-five women known to be pregnant the test was positive in only fourteen. They also found that urine from patients suffering with cancer and acute salpingitis gave positive results. According to the latter authors the concentration of the urine is an important factor; the efficiency of the test diminishing with dilution of the urine used.

Again it may be said that to this time the only biologic tests that satisfactorily give consistent results in the diagnosis of pregnancy are the Aschheim-Zondek test and the Friedman modification of this test.

MARE SERUM FOR STERILITY

To the Editor—What is the status of the one shot fertility treatment now frequently reported in the newspapers?

EMILE BRUNOR, M.D., New York

ANSWER—Drs. Davis and Koff reported their work on "The Experimental Production of Ovulation in the Human" at the Dallas, Texas, meeting of the Central Association of Obstetricians and Gynecologists. They found that a gonadotropic substance derived from the serum of pregnant mares and given intravenously in sufficient doses to women, will produce development of follicles and normal ovulation. These results were confirmed on many patients by laparotomy and microscopic examination of the ovaries.

This mare serum gonadotropic substance, first described by Cole and Hart in 1930 and isolated in a sufficient state of purity so that it could be given intravenously by Cartland and Nelson, is unlike previously reported gonadotropic substances. It will apparently reproduce in its action the effects of the anterior lobe of the pituitary. It therefore exhibits follicle stimulating as well as luteinizing effects.

This gonadotropic substance may be of therapeutic use in patients who fail to ovulate normally. This may be an important factor in the causation of sterility when all other factors have been ruled out. As with all patent endocrine products this preparation must be employed with great care, particularly until more is known about the reactions of the human ovary to it. The mare serum extract must be used with the same caution as that required for all horse serum preparations as severe allergic reactions may occur.

THYMUS-PITUITARY MIXTURES IN OBSTETRICS

To the Editor—A preparation known as Thytutary is being sold by the Blue Line Chemical Company with the claim that the thymus gland extract in the preparation has a selective action on the muscles of the cervix. Having seen a ruptured uterus today as a result of the use of the product I feel thoroughly convinced that this use and the claims for it are unfounded.

W.D., North Carolina

ANSWER—Thytutary, a product of the Blue Line Chemical Company, is said to be a mixture of extracts of thymus and posterior pituitary. A number of other pharmaceutical houses market similar products, one of which thymophysin was the subject of a report by the Council on Pharmacy and Chemistry in 1931 (*THE JOURNAL*, March 14, 1931, p. 860).

The Blue Line Chemical Company (no products of which have been accepted by the Council) claims that thytutary is "An Obstetrical Aid and Factor of Safety" and further that this preparation is a combination of endocrine

and chemical substances which hasten cervical dilatation by removing the inhibition or obstruction" and that it does not force the process by stimulating the uterine muscles to exert unnatural pressure. This is obviously a dangerous and unwarranted statement.

In its report on thymophysin the Council pointed out "that there is no unequivocal evidence that either oxytocic or pressor activities of pituitary are altered by the simultaneous administration of thymus, that experimentally no difference could be found in the oxytocic or pressor activities of pituitary alone as compared with pituitary plus thymus (in comparisons of thymophysin with equivalent doses of pituitary no differences could be demonstrated)." The Council also declared that "the lack of complete harmlessness has already been shown by reports which are appearing from time to time in the literature reporting rupture of the uterus, tetanic contractions and cervical tears following its use." The Council, therefore, declared thymophysin unacceptable for inclusion in N. N. R.

A mixture of extracts of posterior pituitary and thymus is quite as liable to produce uterine rupture as an extract of posterior pituitary alone of equal potency. Such mixtures are unscientific and the claims often made for them are highly reprehensible.

PROGRESSIVE MUSCULAR DYSTROPHY

To the Editor—Is there any recent literature on the treatment of pseudohypertrophic progressive muscular dystrophy other than with the use of aminoacetic acid? Have there been any encouraging results in the treatment of this disease with any endocrine preparation?

M.D., Pennsylvania

ANSWER—Although aminoacetic acid has not been abandoned as one of the forms of treatment for pseudohypertrophic progressive muscular dystrophy, other drugs are now being tried, particularly prostigmine and cevitamic acid. Winkelman and Moore (*Arch. Neurol. & Psychiat.* 37:237 [Feb.] 1937) noticed increase in muscular power temporarily after the use of prostigmine and felt that in the early stage of the disease some improvement might be expected or even an arrest of symptoms obtained. They had treated only a few cases for a relatively short period.

Hirata and Suzuki (*Klin. Wchenschr.* 16:1019 [July 17] 1937) have recently reported results from the use of the sodium salt of cevitamic acid in the treatment of muscular dystrophy. It was first determined that these patients had C hypovitaminosis. From 200 to 500 mg. was used daily, intravenously or intramuscularly. During the course of this treatment, examination of the cerebrospinal fluid revealed an increase in the content of vitamin C. The authors report that both subjective and objective improvement could be noticed. They also felt that continued oral administration of large doses of the sodium salt of cevitamic acid surpassed in efficacy all other treatments of progressive muscular dystrophy.

YELLOW FEVER VACCINE AND TROPICAL DISEASES

To the Editor—A patient is going into the jungles of Colombia, South America. What precautions should he take against tropical diseases such as yellow fever and malaria? I have vaccinated him against smallpox and am giving him typhoid-paratyphoid immunizations.

M.D., Washington

ANSWER—Any person going into the jungles of Colombia should be immunized against yellow fever. There is available now a vaccine that will protect a person against the infection. Information concerning the source of the vaccine may be obtained by writing to the United States Public Health Service. The best prophylactic measure against a malaria infection is living in screened quarters. One who is unable to have a well screened room should protect oneself after nightfall by the use of bed nets of good quality. Quinine has little prophylactic value but should be available to treat any acute infection. It is always best to obtain advice from the recognized local practitioners concerning the amount of quinine to use.

INTERFEROMETRIC EXAMINATIONS OF BLOOD FOR HORMONES

To the Editor—In the Nov. 13, 1937 issue of *THE JOURNAL* page 1659 was an inquiry by M.D., New York regarding the interferometric examination of the blood for hormones. This is described in Winkelman's *Handbuch der biologischen Arbeitsmethoden* section IV, *Angewandte Chemie und Physik*, part 2, *Fermentforschung*, 2, page 217. By means of the interferometer the author was apparently able to measure abwehrfermente (defense ferments) in the serum. An increase or decrease of titer of ferment would indicate a corresponding dysfunction of the respective gland activity which was subsequently verified by surgical examination. The principle is similar to the Winkelman reaction, the body producing defense ferments against placental tissue or other foreign substance. The ferments break down the high protein to amino acid which in turn give an increased interferometric reaction. A detailed discussion of the phenomenon is given.

JOSEPH L. FETZ, M.D., Washington, D.C.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL January 22 page 309

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS *Parts I and II* Examinations will be held in all centers where there is a Class A medical school and five or more candidates who wish to write the examination Feb 14 16 May 9 11 (limited to a few centers) June 20 22 and Sept 12 14
Ex Sec Mr Everett S Flwood 225 S 15th St Philadelphia

SPECIAL BOARDS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILIOLOGY *Written examination for Group B applicants* will be held in various cities throughout the country April 16 *Applications due Feb 15* *Oral examinations for Group A and B applicants* will be held at San Francisco June 13 14
Sec Dr C Cuy June 416 Marlboro St Boston

AMERICAN BOARD OF INTERNAL MEDICINE Examinations will be held in various centers of the United States and Canada Feb 14 Chairman Dr Walter I Biering 406 Sixth Ave Suite 1210 Des Moines Iowa

AMERICAN BOARD OF OBSTETRICS AND GYNCOLOGY *Written examinations and review of case histories for Group B candidates* will be held in various cities of the United States and Canada Feb 5 *General oral clinical and pathological examinations for all candidates (Groups A and B)* will be conducted in San Francisco June 13 14 *Application for admission to Group A examinations must be on file before April 1* Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh (6)

AMERICAN BOARD OF OPHTHALMOLOGY San Francisco June 13 Washington D C Oct 8 Oklahoma City Nov 15 *All applications should be filed immediately and case reports in duplicate must be filed not later than sixty days before the date of examination* Sec Dr John Green 3720 Washington Blvd St Louis Mo

AMERICAN BOARD OF OTOLARYNGOLOGY San Francisco June 10 11 Sec Dr W P Wherry 1500 Medical Arts Bldg Omaha

AMERICAN BOARD OF RADIOLOGY San Francisco June 10 12 Sec Dr Byrl R Kirklm 102 110 Second Ave S W Rochester Minn

AMERICAN BOARD OF UROLOGY San Francisco June 11 13 *All condensed case reports must be filed by April 1* *Written examination* will be held in various cities in the United States and Canada April 2 Sec Dr Gilbert J Thomas 1009 Nicollet Ave Minneapolis

Hawaii October Examination

Dr James A Morgan, secretary, Board of Medical Examiners, reports the oral and written examination held at Honolulu, Oct 11-14, 1937. The examination covered 10 subjects and included 80 questions. An average of 75 per cent was required to pass. Two candidates were examined, both of whom passed. The following schools were represented:

School	PASSED	Year Grad	Per Cent
Creighton University School of Medicine		(1936)	80
Pennsylvania Medical School			
Shanghai		(1936)	82.3

Seven physicians were licensed by endorsement from August 14 through October 2 after an oral examination. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
College of Medical Evangelists		(1937)	N B M Ex
Harvard University Medical School	(1932)	(1934)	N B M Ex
Tufts College Medical School		(1935)	N B M Ex
University of Michigan Medical School		(1933)	N B M Ex
Hahnemann Medical College and Hospital of Philadelphia		(1936)	2) N P M Ex

Illinois October Examinations

Mr Homer J Byrd, superintendent of registration, Illinois Department of Registration and Education, reports the written examination held in Chicago, Oct 19-21, 1937. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Ninety candidates were examined, 88 of whom passed and two failed. The following schools were represented:

School	PASSED	Year Grad	Per Cent
Howard University College of Medicine		(1936)	75
Chicago Medical School		(1937)	78
80 80 80 81 83 83 84 84 86 88			
Loyola University School of Medicine		(1936)	84
(1937) 80 * 84, 85 86 86			
Northwestern University Medical School		(1936)	82
(1937) 81 82 82 83 84 84 84 86 86 86 86			
87 87 88			
Rush Medical College		(1936)	82
85 87 (1937) 81 84 84 84 85 85 86 86 88			
University of Illinois College of Medicine		(1912)	77
(1936) 84 (1937) 81 83 84 84 84 85 85 85 86			
86 87 87 87 88			
Johns Hopkins University School of Medicine		(1916)	84

University of Michigan Medical School	(1931)	79	(1936)	84
Wayne University College of Medicine	(1937)			81
University of Minnesota Medical School	(1936)			85
Cornell University Medical College	(1933)			85
New York University University and Bellevue Hospital Medical College	(1933)			84
Syracuse University College of Medicine	(1936)			83
University of Wisconsin Medical School	(1936)	83	84	85
University of Alberta Faculty of Medicine	(1930)			84
Queen's University Faculty of Medicine	(1936)			83
University of Toronto Faculty of Medicine	(1936)	80	83	
Medizinische Fakultät der Universität Wien	(1934)			80
Université de Paris Faculté de Médecine	(1935)			79
Albert Ludwigs Universität Medizinische Fakultät Freiburg	(1925)			78
Friedrich Wilhelms Universität Medizinische Fakultät Berlin	(1921)	81	82	80
Universität Heidelberg Medizinische Fakultät	(1924)	82		81
Magyar Királyi Pazmany Petrus Tudományegyetem Orvosi Fakultása Budapest	(1916)			83
Universitatea din Bucuresti Facultatea de Medicina	(1934)			77

School	FAILED	Year Grad
Chicago Medical School		(1937)
Ludwig Maximilians Universität Medizinische Fakultät München		(1912)

Forty seven physicians were successful in the practical examination for reciprocity and endorsement applicants held in Chicago, October 21. The following schools were represented:

School	PASSED	Year Grad	Reciprocity with
University of Southern California School of Medicine	(1936)	California	
University of Colorado School of Medicine	(1936)	Colorado	
George Washington University School of Medicine	(1929)	Maryland	
Howard University College of Medicine (1929)† Ohio	(1933)	Missouri	
Loyola University School of Medicine	(1936)	Missouri	
Northwestern University Medical School	(1922)	Wisconsin	
Rush Medical College	(1934)	Ohio	
University of Illinois College of Medicine	(1935)	California	
Indiana University School of Medicine	(1925)	(1931)	Indiana
State University of Iowa College of Medicine	(1927)		
(1931)† (1935)† Iowa			
University of Minnesota Medical School	(1933)	(1937)	Minnesota
St. Louis University School of Medicine	(1928)	(1925)	
(1935) 2) Missouri			
Washington University School of Medicine	(1932)		
(1933) (1936) Missouri			
University of Nebraska College of Medicine	(1935)	2) Nebraska	
Ohio State University College of Medicine	(1936)	Ohio	
University of Oklahoma School of Medicine	(1933)	† Oklahoma	
Vanderbilt University School of Medicine	(1931)	† Tennessee	
Baylor University College of Medicine	(1935)	Texas	
Medical College of Virginia	(1929)	Virginia	
University of Wisconsin Medical School	(1933)	Wisconsin	
McGill University Faculty of Medicine	(1917)	Michigan	

School	PASSED	Year Grad	Endorsement of
University of Colorado School of Medicine	(1934)	N B M Ex	
Yale University School of Medicine	(1934)	† (1936)	N B M Ex
George Washington University School of Medicine	(1936)	N B M Ex	
Northwestern University Medical School	(1935)	† N B M Ex	
School of Medicine of the Division of the Biological Sciences	(1936)	N B M Ex	
University of Illinois College of Medicine	(1933)	U S Navy	
Louisiana State University Medical Center	(1937)	N B M Ex	
Johns Hopkins University School of Medicine	(1932)	N B M Ex	
Tufts College Medical School	(1935)	† N B M Ex	
University of Michigan Medical School	(1932)	N B M Ex	
Columbia Univ. College of Physicians and Surgeons	(1934)	N B M Ex	
Duke University School of Medicine	(1934)	N B M Ex	

* This applicant has completed the medical course and will receive the M.D. degree on completion of internship
† License has not been issued
‡ Verification of graduation in process
§ Verification of graduation in process
¶ Average grade not reported

Wyoming October Examination

Dr G M Anderson, secretary, Wyoming State Board of Medical Examiners, reports the written examination held at Cheyenne, Oct 18, 1937. An average of 75 per cent was required to pass. Three candidates were examined, two of whom passed and one failed. Seven applicants were licensed by reciprocity after an oral examination. The following schools were represented:

School	PASSED	Year Grad	Per Cent
Georgetown University School of Medicine		(1936)	80.8
University of Nebraska College of Medicine		(1935)	81.6

School	FAILED	Per Cent
Osteopath*		71.5

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Illinois College of Medicine	(1936)	Illinois	
University of Louisville School of Medicine	(1936)	Utah	
University of Michigan Medical School	(1927)	Michigan	
St. Louis University School of Medicine	(1935)	Missouri	
University of Oklahoma School of Medicine	(1932)	Kansas	
Osteopath†		Missouri	New Mexico

* Examined in surgery
† Licensed to practice surgery

Book Notices

Atlas of Hematology By Edwin E. Osgood, M.A., M.D., Assistant Professor of Medicine and Head of Experimental Medicine, University of Oregon Medical School, Portland; and Clarice M. Ashworth, Medical Illustrator, University of Oregon Medical School, Portland. Cloth. Price \$10. Pp. 225, with 325 illustrations. San Francisco: J. W. Stacey, Inc., 1937.

There have been atlases of hematology published in the past the chief aim of which has been to aid the reader to identify various types of blood cells. While this volume serves that purpose well, it goes beyond that function. It is apparent from the organization and manner of presentation that it aims at giving the student and the practitioner of medicine a method of planning, performing and interpreting a systematic hematologic examination. The authors emphasize in their preface that the book was written primarily for the clinician, the medical student and the technician rather than for the hematologist. Yet there is included much information that only an experienced hematologist could interpret properly. Perhaps Dr. Osgood is too optimistic about how easily hematologic training can be acquired. Most physicians know and most medical students will learn that identification of blood cells constitutes only a part of clinical hematology.

In the first chapter points are stressed in history taking, physical examination and laboratory study of patients with disorders of the blood-forming organs. Normal hematologic standards are conveniently arranged in tabular form according to sex and age groups. Then follows the senior author's rationalizations on nomenclature of blood cells. While most of the points he raises are valid and logical it is doubtful whether he can uproot such traditional names as erythrocyte and replace it with akaryocyte or polymorphonuclear and substitute lobocyte. He summarizes his discussion on nomenclature with a table giving the name of various cell series and his own recommendations as to the name comprising them, and he enumerates the various names that have been applied to the same cell. Throughout the book, however, he gives the traditional name of the cell in parenthesis after the terminology he proposes. Cell identification is then discussed and the senior author has developed a system based on answering a series of questions similar to systems used in teaching qualitative chemical analysis. Tables are provided for quick reference, and cells illustrating these criteria can be identified by their number. A short but adequate discussion is then devoted to the histogenesis of blood cells. Chapters II to X illustrate 316 cells in color and describe the cells of the blood and sternal marrow as well as parasites that invade the hemopoietic system. Gradations of maturity and variations in morphology are accurately illustrated and described for cells in all series. The remaining chapters discuss the general principles of diagnosis and a large number of tables of differential diagnosis have been constructed to summarize this information. After each disease mentioned there follows a short description of the characteristic hematologic picture. In the appendix the methods are briefly discussed and the reader is referred for further detail to the senior author's book on laboratory diagnosis. The bibliography has been carefully arranged with a generous and well selected list of pertinent references to complement each chapter.

The book represents a great deal of painstaking effort both by the junior author, who is responsible for the colored plates, and by the senior author who supplied the text material and did the editing. The colored plates are well done and while they lack the skill of color photo-engraving of well known European atlases, they will serve most efficiently the purpose for which they were intended. Not many atlases of hematology contain so many colored plates showing the variety of cells of the various series. This book should serve the physician, medical student and technician well in their venture into the field of hematology, although few hematologists or those who have had experience with hematologic work will share the senior author's rather optimistic view that this book, a microscope and a patient will solve a large part of the vicissitudes of hematology. It will, however, provide a great deal of highly desirable information which most students and physicians will enthusiastically welcome. It deserves a place in every library.

Handbuch der experimentellen Pharmakologie Begründet von A. Heubner. Herausgegeben von W. Heubner, Professor der Pharmakologie an der Universität Berlin, und J. Schüller, Professor der Pharmakologie an der Universität Köln. Band III. Enthaltend Beiträge von F. Holtz et al. Paper. Price 36 marks. Pp. 276, with 21 illustrations. Berlin: Julius Springer, 1937.

This "supplement" brings to the present the subjects which it treats. There are included the atropine group, saccharin, the posterior pituitary, the parathyroid, arsenic and antimony and their compounds. While the chief emphasis is on experimental pharmacodynamics, one finds in it many items of practical therapeutic value. Thus there is warning against the use during excessive heat of drugs containing atropine because they interfere with heat regulation by checking perspiration. The increased pulse rate produced by them may be disadvantageous in arteriosclerotic and syphilitic diseases of the heart. The large doses of atropine now advocated in parkinsonism may produce habituation. A review of the experimental evidence proves the harmlessness of saccharin. It would take a chronic ingestion of more than 5 to 10 Gm. a day before harm would result, and this would be chiefly in the form of intestinal irritation. To the two active principles of the posterior lobe of the hypophysis the terms vasopressin and oxytocin are applied. The book contains an excellent chapter on the chemotherapy of the antimony compounds. This supplement including such a variety of subjects, makes an index for the whole handbook which now numbers ten volumes all the more mandatory.

Hackh's Chemical Dictionary Containing the Words Generally Used in Chemistry and Many of the Terms Used in the Related Sciences of Physics, Astrophysics, Mineralogy, Pharmacy, Agriculture and Biology with Their Pronunciations. Based on Recent Chemical Literature. By Ingo W. D. Hackh, A.M., F.A.C.P., F.R.S., Professor of Chemistry, College of Physicians and Surgeons, A School of Dentistry of San Francisco, California. With the collaboration of Julius Grant, M.Sc., Ph.D., F.I.C. Second edition. Cloth. Price \$12. Pp. 1020, with illustrations. Philadelphia: P. Blakiston's Son & Co., Inc., 1937.

Seven years ago a review in THE JOURNAL of the first edition commended the author and his work. It has received a thorough revision but, in general, additions rather than corrections have been made. The dictionary now contains terms coined during the seven year interval that are used in connection with new substances, new instruments and new methods. The naming of substances in such a way that confusion will be avoided by scientists now and in generations to come should be considered a duty scientific workers of today owe to science and to civilization. This dictionary follows the American Chemical Society in questions of nomenclature and spelling. By way of correction it is noted that lumisterol is defined as being irradiated ergosterol, and that calciferol is defined as being viosterol. Lumisterol, calciferol and tachysterol are all formed by irradiating ergosterol and viosterol is an impure product containing these and other sterols. This dictionary again will find a place for itself within easy reach of chemists of all classifications and also on the tables of scientists working in such bordering fields as physics, mineralogy, pharmacy and the various branches of medicine. The author is to be commended for this work. It is the most valuable book of its kind in the field.

Essentials of College Chemistry By C. H. Whiteford, Professor of Chemistry, and R. G. Coffin, Associate Professor of Chemistry, Colorado State College. Cloth. Price \$4. Pp. 111, with 11 illustrations. St. Louis: C. V. Mosby Company, 1937.

Too often the elementary chemistry student cannot fully grasp the first few weeks' work because of the limited time for the necessary correlation of factual details and basic conceptions. This book written for the beginning college student is admirably adapted to the average student's ability. Its brevity, organization and presentation indicate wide teaching experience by the authors. Modern chemical and physical theories and laws are explained in a simple understandable manner which at times tends to be too much curtailed. The subject matter is divided into thirty-eight chapters which in turn are subdivided into three parts separated by general reviews. The first part is devoted to the basic chemical conceptions, the second presents chemical and physical behavior while the third gives brief discussions of organic chemistry, colloids and the metallic elements. The material is given in a clear, concise form with little mathematical treatment. Many

instructors will consider the book too elementary and too brief for their use, for, as the authors say, "it is planned as a guide to a course of reasoning rather than a presentation of specific chemical behavior of substances." Some of the subjects, such as chemical history, energy, chemical change, chemistry and physics of plant life, and radioactivity, are very brief and give only cursory descriptions. The drawings and illustrations are rather crude.

An Analysis of the Results of Treatment of Early Latent and Mucocutaneous Tertiary Syphilis By W. R. Snodgrass and R. J. Pelera. Medical Research Council Special Report Series No. 224. Paper. Price 2s. Pp. 126. London: His Majesty's Stationery Office, 1937.

This is an analysis of the results of treatment in 1,282 cases of syphilis (570 early, 239 latent, 473 late mucocutaneous) from the Western Infirmary of Glasgow. Only 177 of the early, 105 of the latent and 180 of the late mucocutaneous cases had been followed for more than two years, and, as the authors point out, shorter periods of observation are nearly valueless. The summary of final results is based largely on the serologic rather than the clinical outcome, and the authors attempt a comparison of their material with that of the American Cooperative Clinical Group, failing to allow for variation in sensitivity of serologic tests performed in Great Britain and here, or as between different clinics here. In spite of the British use of nearsphenamine as contrasted with the American use of arsphenamine, and allowing for minor differences in treatment procedure, the results obtained in Glasgow, in both early and late syphilis, are strikingly similar to the American Cooperative Clinical Group results. The statistical method of presentation chosen by the authors is tedious and difficult to follow.

The Diagnosis of Nervous Diseases By Sir James Purves Stewart. FRCMG, CB, MD, Consulting Physician to Westminster Hospital, London. Eighth edition. Cloth. Price \$10. Pp. 842 with 337 illustrations. Baltimore: William Wood & Company, 1937.

This edition of Purves-Stewart's textbook is much better and more complete than its predecessors. There are twenty-six chapters, including physiologic anatomy, method of case taking, delirium, coma, convulsive phenomena, involuntary movements, aphasia, disorders of articulation, cranial nerves, pain, sensation, organic motor paralysis of the upper and lower neuron type, recurrent and transient palsies, incoordination, postures and gaits, trophoneuroses, reflexes, vegetative nervous system, psychoneuroses, electrodiagnosis and electropneurosis, the cerebrospinal fluid, disorders of sleep and intracranial tumors. A considerable portion of the individual chapters has been rewritten. There are 111 more pages in this edition than in the seventh. This work, like its predecessors, should prove to be a good textbook for medical students especially. All the new and accepted contributions in clinical neurology find a place in this edition. There are several new illustrations and many of them are excellently drawn or photographed. References are plentiful. This book is recommended to all interested in neurology.

Neuere Ergebnisse auf dem Gebiete der Krebskrankheiten 47 Vorträge gehalten mit Unterstützung des Reichsausschusses für Krebsbekämpfung in einem internationalen Fortbildungskurs der Berliner Akademie für Ärztliche Fortbildung (vom 19 bis 26 Oktober 1936) von Prof. Auler et al. Mit einem Vorwort von Geheimrat Prof. Dr. Borst. Herausgegeben von Prof. Dr. C. Adam und Prof. Dr. Auler. Paper. Price 12 marks. Pp. 366 with 66 illustrations. Leipzig: S. Hirzel, 1937.

The experimental study of cancer has made extraordinary advances recently and has furnished an insight into the biologic origins of tumor cells which was not possessed a few years ago. The clinical side, both diagnostic and therapeutic, has been largely a progressive improvement in technique, but in this useful survey of the subject both phases are well treated. Even in the first section, on the transplanted tumor, mention of the work of Shope and Beard on the papilloma of the rabbit shows that contemporaneous material is considered. There is a chapter on the importance of experimental cancer research with a fair summary of the results. Viruses come in for a short survey. The genetic relationships are touched on in a rather casual manner. There is a good chapter, however, by Butenandt on the structure of the carcinogenic substances. One of the best sections is by Lehmann-Facius on the present status of attempts to discover a reliable serum reaction for cancer, in

which he expresses the belief that, while many of the tests are of no value, certain lines of investigation suggest the possibility of obtaining a satisfactory method in the future. The rest of the papers are largely clinical, the most interesting being the one by Hintze on the diagnosis and treatment of bone sarcoma. He is somewhat more optimistic concerning his results than those who have been working on the subject in this country. Altogether the volume is reasonable in price and for those who read German it forms a useful compendium of recent advances in the cancer field.

Safely Through Childbirth: A Guide Book for the Expectant Mother By A. J. Rongy, M.D., F.A.C.S., Attending Obstetrician and Gynecologist, Lebonon Hospital, New York City. Cloth. Price \$2. Pp. 192 with 20 illustrations. New York: Emerson Books, Inc., 1937.

Dr. Rongy presents in compact and readable style "a guide book for the expectant mother." The first two chapters discuss the anatomy of the pelvis and of the generative organs, the physiology of puberty and the development of the fetus. The third chapter deals with the constitutional changes in the mother resulting from the process of gestation. This is followed by a conservative discussion of the place of analgesia and anesthesia in the relief of labor pain. Chapter V, on *autepartum* care, is especially commended, for it should enable the patient to estimate the adequacy of the supervision she is receiving. The next two chapters explain the process of labor and the factors concerned in labor and deal briefly with the more common operative procedures. It is noteworthy that conservatism is urged in the management of the parturient. Some question arises as to the need for detailing the theories as to the cause of onset of labor. There follows a discussion of postpartum care in its various phases. Chapter IX considers the subjects of abortion and extra-uterine pregnancy, and the final chapter speaks of the phenomena associated with the menopause. The book is easily read, instructive, well balanced, and conservative in its views on the use of analgesics and in the matter of operative intervention. It should prove of value to the patient during her obstetric adventure and give her a keener appreciation of the responsibilities of her physician.

The Postmortem Examination By Sidney Farber, M.D., Associate in Pathology, Harvard Medical School. Cloth. Price \$3.50. Pp. 201 with 33 illustrations. Springfield, Illinois: C. Baltimore; Charles C. Thomas, 1937.

This represents a practical addition to books on pathology, most of which are too brief in their descriptions on the technique of the necropsy. The beginning pathologist and the practitioner who may be called on for the performance of a postmortem examination will find clear, concise statements on the procedures and techniques in the performance of a routine necropsy. A short chapter on the history of the necropsy introduces the subject and is followed by remarks on its value in medicine and the importance of certain regulations. The technique of the examination of the cavities and the viscera are described and aided by diagrammatic illustrations. Necropsy procedures in connection with poison cases, and the examination of infants and children are emphasized in separate chapters. References to more comprehensive papers and works on special subjects pertaining to postmortem examination add to the value of the book. A copy of a protocol by Virchow is appended and will prove of interest to the student of pathology.

Post Graduate Surgery Edited by Rodney Malingot, F.R.C.S. Volume III. Cloth. Price \$45 per set of 3 volumes. Pp. 3575-3584 with 1015 illustrations. New York: D. Appleton-Century Company, Incorporated, 1937.

This volume covers the surgical specialties, limited regions of general surgery and medical and psychiatric problems in surgery. There is a good discussion of the operations for hernia and particularly of the newer plastic procedures for complicated and recurrent hernias including the use of fascial strips. The chapter on plastic surgery deals mainly with facial deformities, which are discussed in detail. Obstetric surgery receives brief attention, and the chapter appears to be out of place. Surgery of the cardiovascular system is well presented but in less detail than surgery of the lymphatic system. Orthopedic surgery is limited to operations on the joints, bone tumors and amputations. The chapters on eye, ear, nose and throat and venereal diseases are rather elementary for such a

treatise The chapter on diseases and injuries of the jaws is excellent Roentgen therapy and physical medicine are discussed in some detail, and the medical and neurologic considerations of surgical diseases will prove valuable to the surgeon

Handbuch der experimentellen Pharmakologie Begründet von A. Heffter. Ergänzungswerk. Herausgegeben von W. Heubner, Professor der Pharmakologie an der Universität Berlin und J. Schüller, Professor der Pharmakologie an der Universität Köln. Band IV. General Pharmacology. By A. J. Clark. Paper. Price 24 marks. Pp. 228 with 79 illustrations. Berlin: Julius Springer, 1937.

This small volume by Clark represents an effort to organize the subject of interactions between drugs, as chemicals and cells on the basis of known and applicable laws of physical chemistry. However, the author fully realizes "that physicists and chemists have applied mathematical methods of analysis to data obtained by biologists without realizing the inaccuracy of the data which they have treated, and have obtained proofs of the occurrence of biological impossibilities, and these proofs have been accepted by biologists who have been impressed, if not mesmerized, by the imposing formula provided." The author has limited his concern chiefly to the simplest of available systems, such as enzymes and unicellular organisms, in relation to drugs. He takes up, among other subjects, reactions between drugs and proteins, drugs and enzymes, kinetics of drug action on cells, synergism and antagonism, and quantitative aspects of chemotherapy. In no sense can the book be considered a pharmacology immediately serviceable to the clinician in search of drugs for use in therapy. It can be read, however, by the pharmacologist, physiologist and general biologist with a great deal of profit and hence should be a valuable addition to biologic and medical libraries.

Practical Methods in Biochemistry By Frederick C. Koch, Professor of Biochemistry, University of Chicago. Second edition. Cloth. Price \$2.25. Pp. 302 with 18 illustrations. Baltimore: William Wood & Company, 1937.

Biochemistry is a fundamental subject in medicine, founded on general chemistry, physics and biology. This book assumes that the student has training in these subjects. While it is intended to be a practical companion to the general subject of biochemistry, considerable explanatory matter is added to help correlate the subject and to save time for the student. It aims to combine the quantitative methods of the chemist with the comparative ones of the biologist. Throughout one encounters valuable suggestions that only experience can give. For example, in the determination of urea by the Folin-Wu method: "Never add paraffin oil or caprylic alcohol or other alcohols to prevent foaming. They interfere with nesslerization later." The book is divided into three parts, which are subdivided into thirteen chapters as follows: 1. Cell constituents—carbohydrates, lipins, proteins, nucleoproteins and nucleic acids, hydrogen ion concentration. 2. The chemistry of the digestive tract—salivary digestion, gastric digestion, intestinal digestion, bile. 3. Blood and urine—blood and hemoglobin, the quantitative analysis of blood, the quantitative analysis of urine, the chemical examination of urine for pathologic conditions. The subjects are accurately and concisely treated. An appendix gives detailed instructions for carrying out the work with a class of students. The index is adequate. It is one of the best laboratory manuals on biochemistry.

Occupational and Environmental Analysis of the Cement Clay and Pottery Industries By R. R. Sayers, Senior Surgeon, J. V. Dallavalle, Passed Assistant Sanitary Engineer, and S. G. Bloomfield, Occupational Analyst. From the Division of Industrial Hygiene, National Institute of Health. Prepared by direction of the Surgeon General. U. S. Treasury Department, Public Health Service. Public Health Bulletin No. 239. Paper. Price 10 cents. Pp. 50 with 7 illustrations. Washington, D. C.: Supt. of Doc. Government Printing Office, 1937.

It is the purpose of this bulletin to indicate practical objectives for which surveys in the field of industrial hygiene may be utilized. While the analysis presented is limited to a portion of the clay, glass and stone industries of the census classification, nevertheless the methodology is fundamental and may be extended to any group of industries desired. The work has necessarily entailed the review of forms covering plants using widely differing methods of manufacture. Every effort has been made to generalize the industry under discussion and to arrange it in a manner that can be applied to all plants making similar products.

Gutachten über die Chiropraktik Erstattet von A. v. Albertini et al. Paper. Pp. 204 with 51 illustrations. Zurich: Orell Füssli Verlag, 1931.

This is an attempt to study seriously the basis, the evidence in behalf of, and the evidence opposed to chiropractic. It is the report of a scientific committee set up especially for this purpose in Zurich. The authors have observed chiropractors at work, have analyzed the available literature, have assembled evidence from many different places, they have talked the matter over with chiropractors, they have themselves made dissections of the spine and analyses of its physiology and of its functions. Their final conclusion is briefly expressed in a single sentence to the effect that a complete study of the material assembled from the literature and their own investigations led the commission to say, relative to the introduction of chiropractic in Switzerland, "Absolutely no." In fact, they found chiropractic of absolutely no use even as an aid to either the physician or the surgeon.

External Diseases of the Eye By Donald T. Atkinson, M.D., F.A.C.S., Consulting Ophthalmologist to the Santa Rosa Infirmary and the St. Vincent Hospital, San Antonio, Texas. Second edition. Cloth. Price \$8. Pp. 718 with 494 illustrations. Philadelphia: Lea & Febiger, 1937.

In the preface to this edition the author states that "from the medical press, as from many other sources, the author has received valuable suggestions, of which, in the preparation of this second edition, he has attempted to avail himself." As in the first edition the references are inadequate and little trouble has been taken to correct inaccuracies in them. The illustrations of operative procedures are still reproduced in a size too small to be of the best advantage. Additions in this edition are "suggestions" on slit lamp microscopy, orthoptic training and observations relative to allergic ocular manifestations. Of the first two there are found merely references to available works concerning the subjects, and a careful perusal fails to divulge the allergic additions, nor is this subject indexed. In spite of these deficiencies, the contribution is of value. The size of the volume has not been materially increased.

Food Values of Portions Commonly Served Compiled by Anna De Planter Bowes, M.A., Director, Nutrition Education, Philadelphia Child Health Society, and Charles F. Church, M.D., M.S., Associate in Lectures, School of Medicine, University of Pennsylvania. Philadelphia: Paper. Price 50 cents. Pp. 13. Philadelphia: The Authors, 1931.

There has always been a considerable demand for tables of food values, particularly caloric values of food as used in ordinary portions. The compilations in the present series are based largely on the available handbooks of Mary Swartz Rose and Dorothy S. Waller. Such collections are most useful both to patients and to physicians who are interested in the mathematics of diet.

A Fourth Type of Phakomatosis: Sturge Weber Syndrome By B. Brouwer, J. Van der Boere and W. Mahony, Fellow of the Rockefeller Foundation. Verhandelingen der Koninklijke Akademie van Wetenschappen te Amsterdam, afdeling Natuurkunde (Tweede Serie). Del. XXXI, No. 4. Paper. Price 2.50 florins. 1 p. 37 with 28 illustrations. Amsterdam: N. V. Noord-Hollandische Uitgevers Maatschappij, 1937.

This small but excellent monograph concerns a syndrome characterized by cutaneous telangiectasis in the face and parts of the body that are associated with buphthalmos, abnormalities of the blood vessels of the choroid and cerebral abnormalities manifesting themselves by imbecility, epilepsy and paralysis usually on the side contralateral to the facial nevus. This is called the fourth type because three other types have been described before. These are (1) tuberous sclerosis (Bourneville's disease), (2) multiple neurofibromatosis (von Recklinghausen's disease) and (3) angiogliomatosis retinae and cerebelli (von Hippel-Lindau disease). There is a good bibliography.

Marcus Whitman, M.D., Pioneer and Martyr By Clifford Merrill Drury, Ph.D. Cloth. Price \$5. 1 p. 473 with 22 illustrations. Callwell, Idaho: Caxton Printers, Ltd., 1937.

To the notable biographies of physicians published in recent years may be added this memorial volume for Marcus Whitman, pioneer in the development of the Northwest where he practiced his profession and worked as a farmer and as a missionary. His name today is commemorated in many Western institutions, including particularly Whitman College. During 1936 several Western states celebrated the one hundredth anniversary of the

arrival of the Whitman party in the Northwest. The names of many physicians who achieved fame in statesmanship are gradually being accumulated in the history of medicine. For those interested particularly in the Americana of the Northwest the publication of this book is a notable event.

The Evolution of the Endurance, Speed and Staying Power of the Racehorse. By W. J. Stewart McKay. M.B. M.Ch. B.Sc. Second edition. Cloth. Price 7s. 6d. Pp. 318, with 28 illustrations. London: Hutchinson & Co. (Publishers Ltd.) 1937.

The interest of physicians in horses, in racing and in problems of breeding among animals is perennial. Here is a scientific work devoted largely to the development, physiology and training of racehorses. It is illustrated by some fine photographs of the greatest performers. The chapter on the effects of overexertion might well serve as a work of reference for neurologists and athletic trainers everywhere.

Miscellany

STANDARDIZATION OF PRECORDIAL LEADS

Following are the joint recommendations of the American Heart Association and the Cardiac Society of Great Britain and Ireland, as represented by their committees: Arlie R. Barnes, Harold E. B. Pardee, Paul D. White, Frank N. Wilson (chairman) and Charles C. Wolferth, Committee of the American Heart Association on the Standardization of Precordial Leads, D. Evan Bedford, John Cowan, A. N. Drury, I. G. W. Hill, John Parkinson and P. H. Wood, Subcommittee of the Cardiac Society of Great Britain and Ireland on the Standardization of Chest Leads.

In the last few years, electrocardiographic leads in which an electrode placed on the precordium is paired with an electrode in contact with some part of the body distant from the heart have come into widespread use. The confusion which has resulted from the lack of uniformity and precision in the technique and nomenclature employed by different observers in connection with leads of this kind has led to an almost universal desire that a standard practice be established. To this end the American Heart Association and the Cardiac Society of Great Britain and Ireland have each appointed a committee to consider this matter and make recommendations. The two committees have conferred and have agreed jointly to make recommendations with reference to the routine use of a single precordial lead. It is understood that either committee may make additional reports with reference to multiple precordial leads and other matters not dealt with in the present report.

1 It is recommended that those who employ a single precordial lead place the precordial electrode on the extreme outer border of the apex beat, as determined by palpation. If the apex beat cannot be located satisfactorily by palpation the electrode may be placed in the fifth intercostal space just outside the left border of cardiac dullness, or just outside the left mid-clavicular line if percussion of the heart is unsatisfactory. Where precordial leads are taken by a technical assistant, the position for the precordial electrode should be marked on the chest by the physician.

2 It is recommended that a single precordial lead in which the precordial electrode has the location specified in the preceding paragraph be known as lead IV B when this electrode is paired with an electrode in the left interscapular region, lead IV R when it is paired with an electrode on the right arm, lead IV L when it is paired with an electrode on the left arm, lead IV F when it is paired with an electrode on the left leg, and lead IV T when it is paired with a central terminal connected through equal resistances of 5,000 or more ohms to electrodes on each of the three extremities mentioned.

It is suggested that for all ordinary purposes lead IV R or lead IV F be employed. The latter lead should have the preference until it has been established that the former, which is somewhat more convenient, is equivalent to the latter for all practical purposes or yields results of equal value.

3 It is recommended that in taking the precordial leads specified the galvanometer connections be made in such a way that relative positivity of the apical electrode is represented in the finished curve by an upward deflection (a deflection above the isopotential level) and relative negativity of the apical electrode by a downward deflection.

It is urged that this convention be adhered to in the case of precordial leads other than those specified, and also in the case of all leads in which one electrode is placed much closer to the heart than the other. In other words, it shall be the standard convention in taking such leads to make the galvanometer connections in such a way that relative positivity of the electrode nearer the heart is represented by an upward deflection.

4 It is recommended that, with the galvanometer connections made as described in the preceding paragraph, the deflections of precordial leads be designated by the symbols P, Q, R, S and T, and that in the application of these symbols the same conventions be employed as in the case of the standard limb leads.

5 It is recommended that in taking precordial leads the electrocardiograph be so adjusted that a deflection of 1 cm in the finished record corresponds to a potential difference of 1 millivolt as in the case of the standard limb leads. Any reduction in sensitivity made necessary by very large deflections should be clearly indicated on the curve, preferably by photographing the effect of introducing a potential difference of 1 millivolt into the galvanometer circuit.

6 It is recommended that the greatest dimension of the apical electrode employed in taking the leads specified in this report be 3 cm or less. A circular electrode between 2 cm and 3 cm in diameter should ordinarily be employed.

7 It is recommended that the terms lead IV (R, F and so on), apical lead, apex-leg lead and so on be used henceforth only in connection with the leads specified in this report.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts. Death from Typhoid Fever Contracted One Year After Industrial Injury.—In the course of his employment Burnett was injured by a blow on his forehead. During the pendency of a proceeding under the Texas workmen's compensation act to obtain compensation for disability attributed to the industrial injury, the workman, about a year after the accident, contracted typhoid fever, from which he died. His widow then filed a claim for compensation for his death. After the industrial board denied her compensation, she appealed to the district court, Jefferson County, Texas, which entered a judgment in her favor on the theory that the industrial injury resulted in lowering the workman's "personal" resistance and to that extent was the "producing cause" of his death. The case eventually reached the Supreme Court of Texas.

Under the Texas workmen's compensation act, said the court, compensation either for disability or for death must have for its foundation an "injury" received by an employee in the course of his employment. "Injury" is defined as "damage or harm to the physical structure of the body and such diseases or infection as naturally result therefrom." A disease, therefore, which naturally results from an injury is itself classified as a compensable injury. On the other hand, it has been held that a disease which does not ensue by reason of any injury inflicted upon the body, that is, by "damage or harm to the physical structure of the body," is not compensable. *Texas Employers Insurance Association v. Jackson* (Tex. Com. App.) 265 S. W. 1027. It follows, therefore, that death by disease not naturally caused by the injury, but intervening as an independent agency, is not compensable. To be compensable, the death must result from the physical injury or from disease or infection which naturally results from the injury. If there be

no such disease or infection there can be no compensable death, unless the physical injury itself be the cause of the death.

The testimony, continued the court, tending to prove that the workman's resistance was lowered by reason of the injury and that such a reduced resistance materially contributed to his death was entirely conjectural. With a disease like typhoid fever, it is a matter of pure speculation to say that the victim would not have died but for the lowered resistance, the extent of which was left to conjecture. The award of compensation in favor of the widow was therefore set aside.—*Texas Employers' Ins Assn v Burnett (Texas) 105 S W (2d) 200*

Workmen's Compensation Acts Death from Coronary Sclerosis in Relation to Diabetes and Trauma—A village policeman had been afflicted with diabetes for about five years. On March 5, in the course of his employment, he fell and bruised his left leg just above the knee. The leg bothered him but he continued to work until April 26 when his family physician called in for the first time, ordered his removal to a hospital. He died May 1 and an autopsy revealed the cause of death as "coronary sclerosis and a septicemic condition following an osteomyelitis of the left femur." Attributing death to the fall his widow instituted proceedings under the Minnesota workmen's compensation act. The industrial commission awarded her compensation and the village appealed to the Supreme Court of Minnesota.

The village contended that the evidence did not justify the finding that the accident contributed to the policeman's death. With this contention the Supreme Court could not agree. The physician who performed the autopsy testified that the cause of death was coronary sclerosis and a septicemic condition following an osteomyelitis of the left femur. He analyzed the case in the following language:

I think because he was diabetic he has had meanwhile several lesser infections furuncles for example and that he had some micro organisms circulating in the blood otherwise he wouldn't have had osteomyelitis at any time that if he had an accident with a traumatism to the left knee causing a bruise this might very well cause a localization at that particular place of the micro organisms circulating in the blood that this localization would eventually in time lead to a large abscess and a septicemic condition that a septicemic condition in itself may cause the death of a patient but in this case the patient had a very bad heart and that the heart as it was together with the other strain caused by the osteomyelitis and the septicemic condition are the cause [sic] of death.

The autopsy showed as I say that Mr Jacobs had coronary sclerosis. In my opinion this overwhelming infection of the femur which involved the left knee joint produced the symptoms which unquestionably were toxemia. In other words Mr Jacobs had some few days previous to his death a generalized infection of the blood. This in turn and because of the toxicity embarrassed the heart muscle further through a toxic myocardium in other words the heart muscle itself revealed evidences of a recent infection. As was shown at autopsy the liver and spleen in turn were also infected in the same manner. I feel that the acute overwhelming infection of the bone aggravated this coronary sclerosis which hastened his death because of this infection or toxemia. Further I believe that the reason for his anemia or lack of oxygen you might say to the heart muscle itself was hastened and aggravated by the same infection as we know that any overwhelming toxemia does decrease the amount of oxygen in the blood the oxygen carried in the blood and tends to cut down the oxygen supply to all parts of the body of course as well as the heart. In this case the important thing is that the heart was primarily affected by the anemia. I believe the condition was certainly hastened no one can say how many years or anything about it no way of ascertaining that but I believe his death was caused indirectly or directly due to the anemia which in turn was caused by an overwhelming infection and toxemia.

Other competent physicians agreed with this testimony. All the witnesses agreed that the deceased was suffering from diabetes and that slight injuries to persons suffering from diabetes often prove fatal. The deceased worked steadily before the accident. The sequence of events from the accident to his death was unbroken. To the lay mind, the court said, the existence of diabetes the accidental injury, the sudden going downhill and the ultimate death point only to the conclusion that the accident hastened the death. If an injury occurs to a workman suffering from a disease which renders him more susceptible to serious consequences from injury and if death follows in close sequence without the proof of any other active exciting cause or the sudden onset of the serious conditions the fact finding body should conclude the court find that the injury caused his death. The award in favor of the widow was therefore affirmed.—*Jacobs v Village of Buhl (Minn) 273 N W 245*

Workmen's Compensation Acts Immediacy of Appearance of Hernia Following Accident—The workman in this case had been operated on for hernia in 1930. Five years later, while assisting a fellow employee in operating a rip saw, he was struck in the left groin by a board. The blow caused him considerable pain and he was scarcely able to walk. He received medical attention on the same day that he was injured but the physicians, while finding a definite tenderness over the left groin saw no evidence of a hernia at that time. The workman continued to have pain and subsequently it was discovered that he did have a hernia. In a proceeding under the workmen's compensation act of Colorado, the referee found that the hernia was due to the industrial accident, which finding was affirmed by the industrial commission and later by the district court. The employer and its insurance company then appealed to the Supreme Court of Colorado.

The award was attacked on the ground that there was no external evidence of the hernia on the same day the accident occurred. The workmen's compensation act provides in part:

An employee in order to be entitled to compensation for hernia must clearly prove first that its appearance was accompanied by pain second that it was immediately preceded by some accidental strain suffered in the course of the employment.

In *Central Surety & Ins Corp v Industrial Commission* 84 Colo 481, 271 P 617, it was said:

Hernia is a protrusion of any viscus or tissue through an abnormal opening in the cavity in which it is normally confined. We must also note that the statute requires not the hernia but the appearance of the hernia to be accompanied by pain. Webster's New International Dictionary gives the following definitions: Appearance 1 Act of appearing. Appear 1 To come or be in sight to be in view to become visible. 4 To become visible or clear to the apprehension of the mind to be known as a subject of observation or comprehension or as a thing proved to be obvious or manifest.

The testimony was conflicting as to when the hernia was ascertainable by the physicians but the inference drawn by the commission that the hernia was caused by the accident seemed to the court to be a reasonable one. The outward evidences of an injury need not become immediately apparent, it is sufficient if it becomes apparent in a reasonable time. It was apparently evident to some one, the court observed that there was a possibility of a hernia at the date of the accident, because the employer in reporting the accident to the commission stated, in response to the question, "Describe fully how accident occurred and what employee was doing at the time," that the employee "was bumped in right [sic] groin with small board—maybe slight rupture." While the evidence was conflicting, there was sufficient competent evidence, in the opinion of the court on which the commission could and did base its findings. The judgment of the district court upholding the award was therefore affirmed.—*Hallack & Howard Lumbar Co v Bagly (Colo) 68 P (2d) 412*

Accident Insurance Death from Heat Prostration—In an action on a provision in an insurance policy promising additional benefits if death occurs in consequence of bodily injuries effected solely through external violent and accidental means, said the Supreme Court of Kansas death by heat stroke or heat prostration entitles the beneficiary to the additional benefits.—*Bukata v Metropolitan Life Insurance Company (Kansas) 67 P (2d) 607*

Society Proceedings

COMING MEETINGS

American Orthopsychiatric Association Chicago Feb 24-26 Dr Norvick C La Var 210 East 68th St New York Secretary
Annual Congress on Medical Education and Insurance Chicago Feb 14-15 Dr W D Cutter 535 North Dearborn St Chicago Secretary
Federation of American Societies for Experimental Biology Baltimore March 30-April 2 Dr D R Hooker 19 West Chase St Baltimore Secretary
Pacific Coast Surgical Association Los Angeles Feb 22-23 Dr H Glenn Bell University of California Hospital San Francisco Secretary
Western Section American Laryngological Rhinological and Otolaryngological Society Santa Barbara Calif Jan 29-30 Dr Arthur C Jones La Brea Bldg Boise Idaho Chairman

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them. Titles marked with an asterisk (*) are abstracted below.

Alabama Medical Association Journal, Montgomery

7 209 248 (Dec.) 1937

- Psychiatry Adrift with the Times W D Partlow Tuscaloosa—p 209
Lobar Pneumonia Etiologic Diagnosis and Specific Treatment J D Dowling and G A Denison Birmingham—p 212
The Modern Treatment of Pneumonia E A Bancker Jr, Atlanta Ga—p 218
Psychologic Aspects of Eye, Ear, Nose and Throat Diseases R M Clements Tuscaloosa—p 222
Scabies F W Riggs, Montgomery—p 226

American Journal of Cancer, New York

31 359 536 (Nov.) 1937

- Sarcoma in Rats from Ingestion of Crude Wheat Germ Oil Made by Ether Extraction L G Rowntree A Steinberg G M Dorrance and E F Ciccone Philadelphia—p 359
Paget's Disease of Skin and Its Relation to Carcinoma of Apocrine Sweat Glands H A Weiner New Haven Conn—p 373
Observations on Nonfiltrable Fowl Tumors Production of Neutralizing Serums Against Filtrates of Rous Sarcoma I by Noninfective Extracts of Sarcoma Induced by 1 2 5 6 Dibenzanthracene L Foulds London England—p 404
Production of Tumors by Cultures of Normal Cells Treated with Filtrates of Filtrable Fowl Tumors R J Ludford London England—p 414
Cytotoxins Lethal to Nucleated Mammalian Cells Normal and Malignant T Lumsden London England—p 430
Nonspecific Action of So-Called Anticancer Serum Note H J Phelps London England—p 441
Reaction of Standard Breeds of Rabbits to the Brown Pearce Tumor A E Casey St Louis—p 446
*Life Expectancy and Incidence of Malignant Disease III Carcinoma of Gastro-Intestinal Tract I T Nathanson and C E Welch Boston—p 457
Carcinoma of Gastrojejunal Stoma Report of Case with Autopsy W B Wartman Cleveland—p 467
Micro-Incineration of Epithelial Tumors with Regard to Radiosensitivity I A B Cathie and J Davson Manchester England—p 471
Activation of Cholesterol by Radiation W V Mayneord and E M F Roe London England—p 476
Tumors in Mice Following Injection of Irradiated Cholesterol in Lard Note H Burrows and W V Mayneord London England—p 484
Rat Sarcoma Produced by Injection of Dye Light Green F S W Schiller New York—p 486
Development of an Epidermoid Cyst in an Autologous Graft of Mammary Tissue A Fischer Copenhagen Denmark—p 491
Preparation of Colloidal Solutions of 1 2 5 6 Dibenzanthracene Retene and Similar Hydrocarbons Notes Patricia H O'Hara and J A Polla Los Angeles—p 493

Life Expectancy of Malignant Disease—From their study of the data of 297 cases of cancer of the esophagus, 315 cases of carcinoma of the stomach and 587 cases of cancer of the rectum, Nathanson and Welch arrive at the following conclusions: 1 The life expectancy in untreated cancer of the esophagus, in the median case, is seven months, in cancer of the stomach thirteen and in cancer of the rectum fourteen months after the onset of the first symptom directly referable to the disease. 2 Five years after onset of the disease about 6 per cent of all patients having cancer of the stomach are alive, at the same time 11 per cent of all patients with cancer of the rectum are alive, and all patients with cancer of the esophagus are dead. 3 The median length of life of patients with carcinoma of the esophagus who have been treated by gastrostomy alone is 10.4 months after onset of symptoms, of those treated by radiation alone, 9.3 months. 4 Patients who had an exploratory laparotomy for cancer of the stomach survived, on the average, a shorter time after onset of symptoms than those who had no treatment at all. 5 The median life expectancy of all patients with treated cancer of the stomach in this series is fifteen months. 6 The age of the patient has no influence on the life expectancy in carcinoma of the

rectum, but comparison with the normal life expectancy at varying ages shows the disease to be more malignant in the young. 7 There is an indication that the female has a slightly better prognosis than the male in carcinoma of the esophagus, stomach and rectum.

American Journal of Diseases of Children, Chicago

54 1211 1438 (Dec.) 1937

- Pathogenesis of Tetany of the New Born H B Kwin New York—p 1211
*Failure of Abundant Sunshine to Protect Against Rickets C U Moore Jessie Laird Brodie Portland Ore A J Thornton A M Leem and Olive B Cordua San Diego Calif—p 1227
Roentgen Studies of Children with Alimentary Disturbances Due to Food Allergy J H Fries and J Zizmor Brooklyn—p 1239
Infectious Diarrhea in the New Born Caused by an Unclassified Species of Salmonella Beatrice McKinlay Wichita Kan—p 1252
Girdle Type Adiposity Among Mentally Deficient Males A O Hecker and V C Warren Polk Pa—p 1257
Adsorption of Polymyelitis Virus by Cholesterol J A Toomey Cleveland—p 1272
Studies on Oxyuriasis IV Some Aspects of the Problem of Therapy W H Wright and Eloise B Cram Washington D C—p 1276
Lobar Pneumonia in Children Differentiation of Recovered Pneumococci into Etiologic Groups and Their Familial Distribution Elizabeth Torrey Andrews New York—p 1285
Macroglossia in Children Review of Literature Report of Case of True Muscular Hypertrophy and Suggested Classification I P Bronstein S M Abelson, R H Jaffe and G von Bonin, Chicago—p 1328

Failure of Abundant Sunshine to Protect Against Rickets—For their comparison of the effect that sunshine had in the protection of children against rickets, Moore and his associates chose two localities (Portland, Ore., and San Diego, Calif.) which differed markedly as to climate but yet were of the same country and of the same altitude and had inhabitants of similar habits of living and diet. The Portland group consisted of 550 and the San Diego group of 393 children. The distribution of race was negligible. Children of a single age group were used, the so called 5 year olds, or those who would enter the public schools the following year. More than 90 per cent of these children exhibited three or more signs of rickets. Maternal statements indicate that about 80 per cent of the children in each city had received medicinal antirachitic treatment. Among the children of San Diego the percentage of rickets was nearly as great as among those of Portland. The teeth of the San Diego children were better as regards caries than those of Portland, the numerical relation being as 57 to 22.

Archives of Otolaryngology, Chicago

26 649 794 (Dec.) 1937

- Effect of Lesions of Tympanic Membrane on Hearing Acuity Observations on Experimental Animals and on Man J E Bordley and Mary Hardy Baltimore—p 649
Vestibulocerebral Pathways Contribution to Central Mechanism of Vertigo J B Price Norristown Pa and E A Spiegel Philadelphia—p 658
*Differential Diagnosis Between Thrombosis of Lateral Sinus and Acute Bacterial Endocarditis H Rosenwasser, New York—p 668
Streptococcal Meningitis with Recovery L B Bernheimer and W Cooley Chicago—p 687
Intradural Conditions in Relation to Rhinology and Otolaryngology Critical Survey of Recent Literature W P Eagleton Newark N J—p 690
Unusual Foreign Body in Nose J J Wolfe Philadelphia—p 736
Advances in the Field of Allergy as Related to Otolaryngology During the Years 1936 and 1937 W W Duke Kansas City Mo—p 739

Differential Diagnosis Between Thrombosis and Endocarditis—Rosenwasser has observed that there are certain criteria which have not been sufficiently stressed and which aid in making the differential diagnosis between thrombosis of the lateral sinus and acute bacterial endocarditis. When the Ottenberg differential blood culture indicates large numbers of colonies in the cultures of blood from the jugular vein and a peripheral vein in the arm, it points to endocarditis as the cause, whereas a large number of colonies in one or both jugular veins and many fewer colonies in the arm point to sinus thrombosis. Correlation of the bacteriologic characteristics of the aural discharge and the pus from the mastoid with blood cultures, as described by Libman and Celler, by Ottenberg and by Friesner, is helpful. None of the pneumococci except the type III pneumococcus cause sinus thrombosis. Cutaneous embolic lesions, petechiae, have never been observed by the author in a case of sinus thrombosis uncomplicated by bacterial endocarditis. Changes of the fundi, varying from slight blurring

of the margins of the disks to 4 diopters of papilledema, occurred in 16 per cent of the cases of sinus thrombosis. It is uncommon in a case of acute endocarditis to note any change in the fundi other than embolic lesions or their manifestations, namely, petechiae, Roth spots or Dolierty-Trubeck lesions. The changing character of the cardiac murmur or murmurs from day to day is significant of endocardial involvement. A definite history of aural disease, mastoiditis and a tender gland at the angle of the jaw associated with corroborative local evidences of venous involvement are additional factors in determining the correct diagnosis. These cases of serious borderline conditions require the closest cooperation between the otologist, the internist and the bacteriologist for their proper diagnosis.

Archives of Pathology, Chicago

24 703 842 (Dec.) 1937

Comparative Histology of Laws and Syphilis in Jamaica H W Ferris and T B Turner New York—p 703

*Simple Atrophy of Liver Its Relation to Increased Resistance D H Sprunt Durham N C—p 738

Interalveolar Communications in Normal and in Pathologic Mammalian Lungs Review of Literature C G Loosli Chicago—p 743

Congenital Atresia of Tricuspid Valve Complicated by Congenital Myosarcoma of Labium Majus A L Amolsch Detroit—p 777

Shock Its Mechanism and Pathology V H Moon Philadelphia—p 794

Simple Atrophy of the Liver—Sprunt examined the tissue from 387 livers. Many cytologic variations were observed. Sections from the livers of eleven persons showed changes of a diffuse nature similar to those described usually as simple atrophy and in general identical with those described by MacNider as occurring in the liver of the dog in association with senility or developing in the process of repair following severe hepatic injury. In these eleven cases of atypical hepatic epithelium the histories were carefully examined in order to see whether there was any factor in the past life of the patient or in the present illness that might have produced these changes. No correlation could be established between the changes in such tissue and any incidents in the histories of the patients. In some of the cases the damage to the liver may be attributed to a toxic factor and in others to senility, but in many these cannot be said to have played a part. It was found that the commonest type of atrophy was associated with passive congestion. This change is similar in many respects to that described by MacNider except that it is generally more pronounced in the region of the central vein and less so at the periphery of the lobule. Also there is frequently necrosis around the central vein. None of the patients had any history of congestive heart failure, nor did they show any anatomic evidence of congestion of the liver or show a change so slight as to indicate that it was merely a terminal condition. If the necropsy is deferred until after the autolytic processes have had time to advance, one finds dilated sinuses and distorted hepatic cells. If the morphologic change in man can be proved to have the same physiologic attributes as the changes MacNider and Smith and his associates described as observed in dogs this fact is highly significant and gives new importance to atrophy of the liver.

Arkansas Medical Society Journal, Fort Smith

34 141 156 (Dec.) 1937

Medical Management of Gallbladder Disease C T Chamberlain Fort Smith—p 131

Cholecystography as an Aid to Diagnosis B R Kirklin Rochester Minn—p 137

Surgical Treatment of Gallbladder Disease A F Hoge Fort Smith—p 149

California and Western Medicine, San Francisco

4 361 436 (Dec.) 1937

Birth Injuries to Bladder and Bowel V F Miller Ann Arbor Mich—p 371

Use Destruction in the Human Body A W Meyer Stanford Univer City—p 375

The Place of Partial Gastrectomy and Duodenectomy in Surgery of Duodenal Ulcer E Gehrels San Francisco—p 384

Tuberculin Test in the School of San Francisco J C Geiger Ethel D Owen and P S Barrett San Francisco—p 388

Fundus Oculi Studies Value of Repeated Fundus Oculi Studies to Better Diagnose and Treatment in General Medicine G L Kilgore San Diego—p 393

Canadian Public Health Journal, Toronto

28 523 574 (Nov.) 1937

*Zinc Sulfate Nasal Spray in Prophylaxis of Poliomyelitis Observation of Group of 4713 Children Age 3 to 10 Years During Epidemic in Toronto Canada F F Tisdall A Brown R D Defries V I Ross and A H Sellers Toronto—p 523

Some Causes of Malnutrition E W McHenry Toronto—p 544

Some Physiologic Aspects of Health J Fiddes Saskatoon Sask—p 548

Puerperal Sepsis and Its Prevention R Hare Toronto—p 554

Zinc Sulfate Nasal Spray in Prophylaxis of Poliomyelitis—Tisdall and his co-workers point out that during an epidemic among the 4,713 children who had nasal spraying with zinc sulfate eleven cases of poliomyelitis occurred to October 12, thirty days from the second spraying. In the control group of 6,300 children, eighteen cases occurred. The attack rate seven days after the first spraying to ten days after the second spraying was 17 per thousand in the sprayed group and 21 in the control group, in the period seven days after the first spraying to twenty days after the second spraying was 21 in the sprayed group and 24 in the control group and in the period seven days after the first spraying to thirty days after the second spraying was 21 in the sprayed group and 29 in the control group. The differences between the attack rates in the sprayed group and the control group are not statistically significant. The study furnishes no evidence of the protective value of a nasal spray containing 1 per cent zinc sulfate, 1 per cent pontocaine and 0.5 per cent sodium chloride, when from 0.5 to 1 cc of the solution was sprayed into each nostril on two occasions with an interval of approximately twelve days, the spraying being performed by otolaryngologists with equipment suitable for spraying the olfactory area. As the spraying must be conducted by otolaryngologists or other physicians specially trained in intranasal treatment, requires special facilities and cannot be done quickly enough to meet the emergency of an outbreak, it cannot be considered a practical public health procedure.

Colorado Medicine, Denver

34 881 952 (Dec.) 1937

Radiation Therapy in Carcinoma of the Skin with Especial Reference to Advanced Lesions E A Pohle Madison Wis—p 895

A Tribute to Anton Ghon 1866-1936 H J Corper Denver—p 900

A Visual Survey in a Rural County J L Swigert and Janet L. Gorton Denver—p 901

Multiple Submucous Lipomas of the Colon G B Kent and A C Sawyer Denver—p 903

Georgia Medical Association Journal, Atlanta

26 565 606 (Dec.) 1937

Treatment of Osteomyelitis Using Bipp and Autogenous Vaccine M T Myers Atlanta—p 565

Complications Following Use of Sulfanilamide A P McGinty Atlanta—p 569

Transparent Specimens Spaltcholz's Method of Preparation J Venable Emory University—p 574

Illinois Medical Journal, Chicago

72 469 552 (Dec.) 1937

*Acute Infections of Upper Lip J A Elliott Bloomington—p 491

Fundamentals of Serum Therapy W H Tucker Springfield—p 494

*Use of Pooled Human Convalescent Scarlet Fever Serum in Surgical Streptococcal Infections S L Goldberg Evanston—p 500

Quantitative Nature of Immunity P S Rhoads Evanston—p 501

Type Specific Antipneumococcus Serum Therapy W D Sutcliffe Chicago—p 511

Human Convalescent Serum and Its Application to Acute Infectious Diseases S O Levinson Elizabeth Penruddocke and A M Wolf Chicago—p 514

Röntgen Therapy in Inflammatory and Infectious Lesions B C Cuthway and R J Maier Chicago—p 517

Control of Rabies M L Blatt Chicago—p 520

Acute Infections of Jaws F W Merrifield Chicago—p 522

Report on 200 Cataract Operations W W Galey Bloomington—p 528

Radiologic Exploration of Some Unusual Fistulous Tracts J I Rams Chicago—p 534

Bile Peritonitis Case Reports R E I Gunning Galeburg—p 536

Ill Advised Nasal Surgery H I Ford Champaign—p 540

Treatment of Gonorrhea with Sulfanilamide H W Hurstman Chicago—p 543

Acute Infections of Upper Lip—Elliott discusses the dangers of surgical intervention in infections of the upper lip and of the face in the so-called danger area. Hunter divides this danger zone 'as the area between the hair line of the forehead above and chin below, with two parallel lines connecting

this area at the outer wall of the orbits on each side" Knowledge of the anatomy of this area is necessary to an understanding of the severity of the lesions under consideration. The causative organism of these infections is *Staphylococcus aureus*. There can also be a streptococcal infection that enters cracks or fissures of the skin and may develop into erysipelas. However, the infections that form the carbuncles have nearly all proved to be due to *Staphylococcus aureus*. The atrium may be through a scratch, abrasion or minor injury and is usually along a hair follicle or sebaceous gland. Diabetes is not a contributing factor in infections of the face but, as Totten has pointed out, high blood sugar in normal persons contributes to repeated attacks of staphylococcal infections. Any infection of this area, no matter how insignificant in the beginning, may develop into a major surgical tragedy. In careful questioning of patients who have severe infections of the upper lip, a history of some trauma, even if slight, can usually be elicited. Patients are usually acutely ill when seen by the physician. The swelling, redness and edema are marked. Fever may range from 1 to 6 degrees F above normal. The pulse is usually rapid. Most patients complain of headache. The symptoms either will begin to abate if the condition localizes or will become more severe with conjunctival injection, paralysis of the ocular muscles and other signs of cerebral invasion. Spreading edema from the lip to the inner canthus in the presence of suffusion of the eyelids is Bailey's indication for ligation of the angular vein. When the cavernous sinus is thrombosed, the ocular muscles become paralyzed by involvement of the nerves in the sheath of the sinus. With thrombosis of the ophthalmic vein and choking of the disk, vision is lost. Too few people know of the danger of these infections. Usually the explanation of the dangers of the infection going to the cavernous sinus and the brain will suffice to awaken in the patient a consciousness of the danger. No matter how slight the lesion, the patient should be advised to use hot wet packs on his face and avoid any trauma. Hot wet packs of either boric acid solution or magnesium sulfate should be applied continuously. The diet should be liquid or soft, so that there will be no chewing. Insulin in small doses can be given if patients have a high blood sugar but are not diabetic. Foreign protein may be given since favorable results have been reported from its use. X-rays have been used with great success during this stage. Surgical intervention is condemned and should be applied only to well developed abscesses in which there has been sufficient time for the development of a protective surrounding wall. Otherwise only a conservative plan of treatment (the application of massive, warm wet sterile dressings, the application of heat over the dressings and gentle removal with sterile forceps of obviously necrotic tissue which might be blocking drainage) has consistently produced satisfactory results and eventual healing without disability and with little scar formation.

Convalescent Scarlet Fever Serum in Streptococcal Infections—Since 1935, Goldberg has collected from the Serum Center records and from his private practice a group of twenty-eight cases of clinical surgical "sepsis," including lymphangitis, cellulitis, lymphadenitis, gangrene, phlebitis and postoperative infections. There are four fatalities and twenty-four recoveries. Each of these patients was critically ill at the time serum was administered, and in most cases the attending physician considered the prognosis grave and asked for serum as a last resort. Most of the patients were given larger doses of serum than had been employed previously. The changes in the mental reactions of the twenty-four patients who recovered, the changes in attitude, appetite, pulse quality, toxicity and the like, are the most marked results of serum therapy. The theory on which the use of serum is based is the inactivation or neutralization of streptococcal toxins in the circulation. This form of therapy is not as specific as would be desired. The pools of serum are made from blood taken from thirty to forty persons recovering from a streptococcal infection contracted during the same season. The use of serum should in no way affect the use of sound surgical principles of treatment. Localized collections of pus should be drained, and incisions should not be made into areas in which the infection is not localized. Serum therapy is advocated only as an adjunct to these and to other supportive measures and not as a substitute for them.

Journal of Bacteriology, Baltimore

34 461 566 (Nov.) 1937

- Application of Sintered (Fritted) Glass Filters to Bacteriologic Work
H E Morton and E J Carnetzky Philadelphia—p 461
Production of Variants of Colon and Aerogenes Groups in Different Media
I Sucrose Medium J J Tregoni and C F Poe
Boulder Colo—p 465
Bacteria in Coal V Burke and A J Wiley Pullman Wash—p 475
Id C B Lipman Berkeley Calif—p 483
Relation of Certain Respiratory Enzymes to Maximal Growth Temperatures of Bacteria O I Edwards and L F Rettger New Haven Conn—p 489
Morphologic and Cultural Studies of Genus *Fusiformis* M K Hine and G P Berry Rochester N Y—p 517
Fusobacterium Genus I Biochemical and Serologic Classification
E H Spaulding and L F Rettger New Haven Conn—p 535
Id II Some Observations on Growth Requirements and Variation
E H Spaulding and L F Rettger New Haven Conn—p 549

Journal of Infectious Diseases, Chicago

61 257 350 (Nov-Dec) 1937

- Extensive Outbreak of Enteric Disease Incited by *Bacillus Dysenteriae*
Schmitz J Schleifstein and M B Coleman Albany N Y—p 257
Attempt to Purify Bacteriophage by Procedure of Vinson J Bronfenbrenner and S E Sulkin St Louis—p 259
Study of an Envelope Pit Privy Elfrida L Caldwell Andalusia Ala—p 264
Pollution Flow from Pit Latrines When Impervious Stratum Closely Underlies the Flow Elfrida L Caldwell Andalusia Ala—p 270
Preservation of Virus of St Louis Encephalitis End A Cook Chicago and N P Hudson Columbus Ohio—p 289
Phenomenon of Local Skin Reactivity to Bacterial Filtrates Its Relation to Anaphylatoxins Forssman Antibodies and Serum Toxicity G Schwartzman New York—p 293
Genesis and Reversion of Bacteriophage Studies in Bacterial Metabolism CVIII A I Kendall and Charlotte Anne Colwell Chicago—p 303
Osmotic Pressure of Blood in Anaphylactic Shock in Rabbits L L Mayer and M S Fleisher St Louis—p 311
Study of Mechanism of Production of Toxic Substances by *Salmonella* Group of Bacteria Frances L Kraft and C N Sirk Ithaca N Y—p 315
Some Cultural and Biochemical Characteristics of Enterotoxic *Staphylococcus* G J Kupchik New York—p 320
Attempts to Transmit Fowl Paralysis C Olson Ithaca N Y—p 325
Production of Schwartzman Phenomenon by Means of Bacterial Extracts W Antopol Newark N J—p 331
Use of Tumor Extracts in Production of the Schwartzman Phenomenon W Antopol Newark N J—p 334
*Infections of Urinary Tract Due to *Bacterium Dysenteriae* E Neter Buffalo—p 338
Relation of Incidence of Human and Animal Serum Disease M J Fox Milwaukee—p 341
Studies in *Staphylococcus* Toxin Phenomenon of Hot Cold Lysis by Active *Staphylococcus* Filtrates B S Levine Washington D C—p 345

Infections of Urinary Tract Due to *Bacterium Dysenteriae*—Neter discusses the bacteriologic and serologic studies of three cases of infection of the urinary tract caused by *Bacterium dysenteriae* and reviews briefly fourteen cases of dysentery bacillus infections of the urinary system collected from the literature. The bacteriologic examination of the catheterized urine specimens from the three cases revealed the presence of dysentery bacilli, in two of the cases of the Hiss type and in one of the Fleener group. All patients were female, two of them children and one an adult in pregnancy. The patients did not present a history of dysentery or show any clinical evidence of intestinal involvement. It cannot be decided whether or not these patients previously had a dysentery infection without clinical manifestations. At least one of the three patients was a carrier of dysentery bacilli, it was possible to demonstrate the presence of dysentery bacilli in the intestinal tract even four weeks after the child had recovered from the acute dysentery bacillus cystitis. This patient, therefore, may be considered as a dysentery bacillus carrier in whom an autoinfection of the urinary tract developed. In contradistinction to this case, dysentery bacilli were never recovered from the feces in the second case. All three patients recovered within a few weeks, both children were treated with mandelic acid, the third patient with methenamine. Concerning the antibody response, the strain of the second patient was agglutinated by the serum of the patient obtained five days after the onset of the infection up to a dilution of 1:40 only, the antibody titer rose within one week to 1:640. The other two patients also showed the presence of specific agglutinins against the respective strains. The third patient had a titer of 1:1600.

New England Journal of Medicine, Boston

217 853 898 (Nov. 25) 1937

- Tuberculosis of Spine in Children E F Cave Boston—p 853
 Endemic Amebic Dysentery in New England C Brenner, Boston—p 859
 Community Nursing Needs S Rushmore Boston—p 861
 Formation of Functional Elbow Joint Following an Unreduced Dislocation R F Sullivan and H M Childress Boston—p 870
 Treatment of Fracture of Olecranon by Kirschner Wire T L Ferenbaugh Fort Ethan Allen Vt—p 872

New York State Journal of Medicine, New York

37 1971 2064 (Dec. 1) 1937

- *Lead Poisoning in the Community From the Standpoint of the Industrial Worker I Gray and I Greenfield Brooklyn—p 1971
 Mosaic Wart An Unusual Type of Plantar Wart A H Montgomery and R M Montgomery New York—p 1978
 Psychic Factors in Pain L Casamajor New York—p 1984
 The Acid Factor in Peptic Ulcer with Especial Reference to Milk Drip Therapy and Partial Gastrectomy A Winkelstein New York—p 1989
 Investigation of Apparatus by the Council on Physical Therapy H A Carter Chicago—p 1995
 The Duodenum Roentgenologically Considered and Including One Case of Primary Carcinoma W E Howe Brooklyn—p 1997
 Compound Fractures of the Lower Extremities with Especial Reference to Osteomyelitis and Amputations G A Carlucci New York—p 2006
 *A Preoperative and Postoperative Nutritional Regimen A Proposed Five Point Scheme M A Bridges New York—p 2009
 Bronchial Asthma Review of 100 Cases Treated at the New York Postgraduate Medical School and Hospital L Mamelok New York—p 2013
 Angina Pectoris in Senility A Foti New York—p 2018
 Thyroid Storm Associated with Diabetic Coma Report of Two Cases B P Sandler and S Biloon New York—p 2023
 Intraspinal Alcohol Injection for Pain Relief in Thrombo Angitis Obliterans Report of Complications Following the Procedure M M Kessler New York—p 2026
 The Thyroid Gland From the Standpoint of Preemployment and Post employment Appraisal of the Applicant for Work E Goetsch Brooklyn—p 2029
 Absence of Pulses in Upper Extremities H B Feuerstein New York—p 2035

Lead Poisoning in the Community—Gray and Greenfield reviewed the records of the New York State Department of Labor pertaining to industrial lead poisoning. During a period of four years (1932 to 1935) there was a total of 342 cases of lead poisoning with an average disability of seventy-three weeks. In the group with permanent partial disability there were eight cases and in the group with death and permanent total disability there were twelve cases. During the same period 322 patients were temporarily disabled, with an average of 27.5 weeks. Considering the number of employees engaged in the various lead industries in the state of New York, the number here reported may be considered comparatively small. However, with the advances made in the field of preventive medicine, especially in the field of lead poisoning many of these cases, if not all, could possibly have been avoided. In fifty-four cases of acute lead poisoning in industry the period of exposure varied from two weeks to three months and the onset in forty-three followed absorption through the respiratory tract. The period of exposure was somewhat longer and the symptomatology not so severe in the eleven patients in whom it was believed that the gastro-intestinal tract was the probable port of entry. Of thirty-eight cases of chronic lead absorption an acute toxic episode occurred in twenty-four after exposure to the inhalation of lead dust for a short time. In a few instances acute colic followed without any undue exposure to the inhalation of lead dust and during the routine and usual work. The occupational distribution of the remaining fourteen cases is such that the chronic absorption of lead was due to inhalation. The acute toxic symptoms were primarily referable to the gastro-intestinal tract. It is probable that the disability and cost of illness could have been reduced to a minimum if the advances made in the field of preventive medicine had been practiced with greater care.

Preoperative and Postoperative Nutritional Regimen.—The regimen that Bridges outlines involves a five point program consisting of five procedures to be followed and five to be avoided. 1 Commencing five days prior to operation a diet low in fat should be instituted. The diet should be augmented by foods high in carbohydrates, with avoidance of non-assimilable carbohydrate and foods with fiber content. This is accomplished by including the tubers and the alimentary

pastes. Table sugar may be added to all suitable vehicles. The patient is asked to ingest half a pound (240 Gm.) of hard candy or soft gum drops on each of the five preparatory days. 2 Fluids should be definitely increased. 3 Sodium chloride, approximately 45 Gm., is included in the preoperative regimen and it is not unusual to observe a gain in body weight of from 2 to 4 pounds (1 to 1.8 Kg.) at the end of the preparation period of five days. 4 Any drastic clearing of the intestinal tract should be done at least forty-eight hours prior to operation. Soap-suds enemas may be given when desired. 5 The institution of mild sedation for the preoperative period has been found to be markedly helpful not only in allaying the commonly present concomitant apprehension but in offsetting any gastro-intestinal irritability that might arise. The prohibitions are as follows: 1 The preoperative administration of opiates particularly in the form of morphine, should not be regularly prescribed. 2 It should not be necessary to administer fluids in any form for from eighteen to twenty-four hours after operation, provided the patient has been properly prepared with adequate fluids. Small sips of liquid by mouth are capable of producing nausea and vomiting. 3 Postoperative diets must vary markedly with the type of condition present, the diet being adjusted in all instances of remaining disorder. A diet pre-dominating in fluids is more readily vomited than one with a more pasty consistency. It is this initiation of regurgitation which is to be strenuously avoided. Irrespective of the pathologic condition, it is not deemed good practice to introduce more than a small percentage of fat for at least five days after operation. 4 Sufficient benefit has not been observed to be derived by advocating an alkaline ash diet either before or after operation. 5 The judicious admittance of visitors is to be avoided.

Rhode Island Medical Journal, Providence

20 189 202 (Dec.) 1937

- The Family Physician and the Feeble-minded Child C Bradley East Providence—p 189
 Peripheral Arterial Disease S J Goldowsky Providence—p 191

Surgery, St. Louis

2 817 986 (Dec.) 1937

- Report on Value of Ivy Bleeding Time Test and Use of Mesterol in Cases of Obstructive Jaundice T Boys Ann Arbor, Mich—p 817
 Splenectomy E L Eliason and J Johnson Philadelphia—p 823
 Abnormal Prominence of the Ears Method of Readjustment J S Davis and E A Kitlowski Baltimore—p 835
 Histologic Study of Intestine Proximal to Carcinoma of the Right Side of the Colon Associated with Anemia C S Welch C W Mayo and E G Wakefield Rochester, Minn—p 849
 Complete Colectomy New and Simple Method of Rib Excision Applicable in Thoracoplasty and Chronic Empyema O H Wangensteen Minneapolis—p 852
 Cytologic Response of Peritoneal Fluid to Certain Substances S F Seeley G M Higgins and F C Mann Rochester Minn—p 862
 Experimental Study on Prevention of Adhesions About Repaired Nerves and Tendons L Davis and L J Aries Chicago—p 877
 Modern Treatment of Varicose Veins Review of 285 Cases A Ochsner and H R Mahorner New Orleans—p 889
 Varicose Veins Treated by Combined Ligation and Injection E I Lowenberg Norfolk Va—p 903
 *Spontaneous Closure of Arteriovenous Fistulas C F Bird Louisville Ky—p 924
 Subcutaneous Emphysema Associated with Perforated Peptic Ulcer H McCorkle San Francisco and J Steven on Cincinnati—p 930
 *Use of Zinc Peroxide in Micro-Aerophilic Infections J E Rhoads Philadelphia—p 937
 Recent Advances in Treatment of Varicose Veins G S Johnson Nashville Tenn—p 943

Spontaneous Closure of Arteriovenous Fistulas—Bird reports three cases of spontaneous arteriovenous closure, sums up the experience of others and concludes that small traumatic arteriovenous fistulas often heal spontaneously. Closure appears to be accelerated by spontaneous venous thrombosis or by systematically repeated obliteration by compression. The possibility of the use of sclerosing solutions suggests itself and may perhaps find limited application when damage to the intima can be confined to the fistula and the walls of the vessel immediately adjacent to it. Injection treatment has been used successfully in two small congenital fistulas by Smith and Horton. Fistulas even when small, increase the cardiac output.

Use of Zinc Peroxide in Micro Aerophilic Infections—During the last two years two patients with chronic leg ulcers infected with micro-aerophilic hemolytic streptococci have been admitted to the Hospital of the University of Penn-

sylvania Since they demonstrate the great value of zinc peroxide in the treatment and healing of their ulcers, Rhoads gives the salient points of their histories In neither of these cases was the organism an obligate anaerobe Recently a patient presented himself for treatment of a chronic high perirectal abscess which began just below the promontory of the sacrum and from which a nonhemolytic streptococcus was cultured by anaerobic methods The abscess opened into the rectum about 4 inches above the anus In this case zinc peroxide was diluted to the consistency of whitewash and administered daily as a low retention enema in amounts of from 3 to 6 ounces (90 to 180 cc) Zinc peroxide may be introduced into the large intestine with impunity and has proved useful in the foregoing case

Tennessee State Medical Assn Journal, Nashville

30 463 510 (Dec) 1937

The Syphilis Campaign Statement by the Liaison Committee Concerning the Syphilis Campaign—p 463
Anorectal Examination and Certain Anal Diseases Cryptitis Papillitis Fissure and Fistula L A Buie Rochester Minn—p 468
Analysis of Certain Principles and Proposals Drafted and Promulgated by a Self Appointed Group of Doctors H H Shoulders Nashville—p 481

Texas State Journal of Medicine, Fort Worth

33 541 604 (Dec) 1937

Liver Deaths Complication of Gallbladder Surgery C G Heyd New York—p 546
The Jaundice Symptom R F Baskett Texarkana—p 549
The Medical Aspect of the Chronic Surgical Gallbladder H Hill San Antonio—p 551
Peritonitis D C Enloe Sherman—p 554
Mesenteric Thrombosis L W Pollok Temple—p 556
Surgical Treatment of Cancer of Generative Organs of Women V S Counsellor Rochester Minn—p 560
Pathology and Treatment of Female Urethra J R Nicholson San Antonio—p 566
Further Report on Childhood Tuberculosis in a Southwestern Community Covering Ten Years Observation J G Young Dallas—p 569
The Sinuses as Foci of Infection J B Nail Wichita Falls—p 572
Headache Its Otorhinologic Aspects J G McLaurin Dallas—p 576
Cysts of the Larynx C C Cody Jr Houston—p 581
Sodium Formaldehyde Sulfoxylate as an Antidote for Acute Mercurial Poisoning S T Trice Talco—p 584
Sulfanilamide in Gonorrheal Ophthalmia in Young Children H W Newman Austin—p 585

Western J Surg, Obst & Gynecology, Portland, Ore

45 637 686 (Dec) 1937

*Treatment of Pelvic Inflammations by Short Hyperpyrexia A V Pettit San Francisco—p 637
Attempt to Correlate Prenatal Temperature with Postpartum Morbidity Florence L Fouch and D W de Carle San Francisco—p 644
Displacements of Nucleus Pulposus K K Sherwood and S N Berens Seattle—p 646
Hystero-graphy as an Aid to Diagnosis of Abdominal Pregnancy Case Report and Review of Literature E M Lazard Los Angeles—p 653
Chronic Traumatic Subdural Hematoma P G Flothow Seattle—p 657
Carcinoma of the Stomach Measures for Extending the Limits of Operability J W Baker and C D Kimball Seattle—p 663

Treatment of Pelvic Inflammations by Hyperpyrexia—Pettit employed short hyperpyrexia treatments in the troublesome group of gynecologic patients in which there are disabling inflammatory lesions of the pelvic organs without a known specific bacterial agent The group is largely made up of patients in whom the infectious foci suggest an original gonorrheal origin and are notoriously difficult to relieve without resorting to destructive surgery The symptom common to this group is pain and is caused by infiltration of the pelvic visceral connective tissue and the swelling of fixed and adherent viscera The patient lies in a continuous water bath on a canvas hammock with the head supported comfortably on a rubber air pillow The bath is begun at a temperature of 105 F and is gradually raised from 3 to 5 degrees during the next thirty minutes The patient is then removed and wrapped well in hot woolen blankets surrounded by a rubber sheet The temperature, which is thus held at a high point for from two to four hours following the removal from the tub, falls rapidly after unwrapping Preliminary preparation consists only in omitting breakfast and giving an enema The clinical material in the report is compiled from the records of patients in the Stanford Gynecological Wards of Lane and San Francisco hospitals All private cases were eliminated, as were the clinic

cases with inadequate follow-up Therefore of the 244 patients with a total of 840 treatments, there remains for study 150 clinical histories with a total of 510 fever baths The average hyperpyrexia treatments per patient was 3.4 The length of follow-up examination averaged a little more than six months and the time required for cure varied between one week and two months, with an average time of five weeks

West Virginia Medical Journal, Charleston

33 485 532 (Nov) 1937

Vaginal Bleeding in the Last Trimester of Pregnancy N W Vaux Philadelphia—p 485
Cesarean Section W A Cracraft and M B Williams Wheeling—p 492
Abdominal Pregnancy Near Term W E Hoffman Charleston—p 496
Extra Uterine Pregnancy G A Ratcliff Huntington—p 498
Placenta Accreta A P Hudgins Charleston—p 504
Operative Intervention in Obstetrics N W Vaux Philadelphia—p 509
Abortions and the Maternal Death Rate T W Nale Charleston—p 512
Diagnosis of Position of Placenta in Utero H G Steele Bluefield—p 515
Rectal Ether Paraldehyde Vapor in Obstetrics A P Hudgins Charleston—p 519

Wisconsin Medical Journal, Madison

36 965 1080 (Dec) 1937

Indigestion Surgical Aspects E L Eliason Philadelphia—p 979
Anesthesia Recent Developments E A Rovenstine New York—p 984
*Treatment of Prenatal or Congenital Syphilis H R Foerster Milwaukee—p 987
Precipitation Tests for Syphilis W F Lorenz Madison—p 993

Treatment of Prenatal or Congenital Syphilis—Foerster considers treatment adequate for early prenatal syphilis when it is extended over a period of two or three years, that is, if during this time a total of twenty-four or more injections of an arsphenamine and thirty or more injections of an insoluble bismuth or mercury compound are given Exception is made in certain comparatively asymptomatic infants who received thorough treatment in their early months of life and then remained symptom free In cases of late prenatal syphilis the requirement for routine minimal treatment should be increased to at least three years of treatment totaling between twenty-five and thirty intravenous injections of neoarsphenamine or mapharsen and from forty to seventy intramuscular injections of an insoluble mercury or bismuth compound Thirty-one of the author's early prenatal syphilitic patients (65 per cent) appear to have been adequately and successfully treated, though this high percentage may be accounted for by a liberal interpretation of treatment during the first six months of life Fifty-three of the late prenatal syphilitic patients (33 per cent) were apparently treated adequately The inadequately treated group includes a number of patients who have been thoroughly treated but are not symptom free and are very likely to be incurable The study emphasizes the need of a social service follow-up system to get the patient to the doctor regularly over a prolonged period It also indicates the necessity of careful, detailed history taking, careful physical and serologic studies and complete recording of observations The most economical and effective time to treat prenatal syphilis is during the mother's pregnancy, with emphasis on the imperative need of routine serologic studies in all cases of pregnancy, regardless of the social status of the patient

Yale Journal of Biology and Medicine, New Haven

10 125 208 (Dec) 1937

The Historical Background of Schwann's Cell Theory C M Goss New York—p 125
Radiation Studies on Mammary Carcinoma of Mice J H Lawrence New Haven Conn R Horn Danville Pa and L C Strong New Haven Conn—p 145
Bio Electric Correlates of Human Ovulation H S Burr L K Musselman Dorothy Barton and Naomi B Kelly New Haven Conn—p 155
Structure and Action Mechanism of Hematin Containing Enzymes K G Stern New Haven Conn—p 161
O Aminoazotoluene as Carcinogenic Agent L L Waters New Haven Conn—p 179
Incidence of Doderlein Vaginal Bacillus During Postclimacterium L Weinstein New Haven Conn and J H Howard Bridgeport Conn—p 185
Inactivation of Pure Line Phages by Bacterial Extracts and Loss of Phage Types in Vivo M L Rakieten and T L Rakieten Brooklyn—p 191

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2 1055 1102 (Nov. 27) 1937

- Mental Symptoms Associated with Head Injury. The Psychiatric Aspect. E. Mapother—p. 1055
 Id. The Neurologic Aspect. J. P. Martin—p. 1061
 Treatment of Virus Diseases of the Skin. R. T. Brain—p. 1064
 Lymphangioplasty. The Fate of Silk. H. Hartley with note by R. A. K. Harper—p. 1066
 Granulosis Rubra Nasi in a Mother and Daughter. F. F. Heiler—p. 1068
 *Antutrin S Intradermal Pregnancy Test. A. M. Gill and J. Hawkins—p. 1069

Intradermal Pregnancy Test with Gonadotropic Substance—Gill and Hawkins investigated the fallacy of the intradermal pregnancy test with gonadotropic substance from the urine of pregnancy in forty-nine men and ninety-eight women. Seventy-three of the women were between the fourth and ninth months of pregnancy and twenty-five were nonpregnant, fifteen being in the premenopausal and ten in the postmenopausal age. Positive reactions were obtained in forty-four men, in fifty-one of the pregnant women, in thirteen of the nonpregnant women in the premenopausal age and in eight of the nonpregnant women in the postmenopausal age. These results were so palpably inaccurate that the authors abandoned further investigation of the test. Reasoning that the reaction obtained in those cases which showed a positive cutaneous flare was perhaps not due to the active hormone content of the injected substance but to the presence of foreign protein, they further tested forty-one cases (ten men thirty-one women), using inactivated substance. Twenty-one of the women were between the fourth and ninth months of pregnancy and ten were nonpregnant. The results of this test were as fallacious as those obtained with active substance.

Indian Journal of Medical Research, Calcutta

25 325 568 (Oct.) 1937. Partial Index

- New Strain of Actinomyces Obtained by Blood Culture. Notes. C. C. Basu—p. 325
 Viability of Leishmania Donovanii Excreted in Nasal Mucus in Indian. Kala Azar. H. E. Shortt and C. S. Swaminath—p. 341
 Deficiencies of the South Indian Diet. W. R. Aykroyd and B. G. Krishnan—p. 367
 Relative Digestibilities of Edible Fats by Castor Seed and Pancreatic Lipases. N. N. Dastur and K. V. Giri—p. 427
 Stabilization of Vitamin C by Pyrophosphate. K. V. Giri—p. 443
 Estimation of Atabrine in Tissues. R. N. Chopra and A. C. Roy—p. 455
 Effect of Antimalarial Drugs on Infectivity of Patients to Mosquitoes. Preliminary Report. R. N. Chopra and B. C. Basu—p. 459
 Action of *p*-Amino Benzene Sulfonamide Against Streptococcal Infections in Mice. S. P. De and U. P. Basu—p. 465
 Relative Immunizing Values of Different Forms of Antirabic Vaccine and Duration of Immunity in Experimentally Immunized Animals. H. E. Shortt, J. P. McGuire, A. G. Brooks, E. D. Stephens and B. N. Lahiri—p. 483
 Some Observations on Experimental Production of Cataract. B. Ahmad and R. C. Guha—p. 547
 Endemic Fluorosis in the Madras Presidency. H. E. Shortt, G. R. McRobert, T. W. Barnard and A. S. Mannadi Nayar—p. 553

J Royal Inst Public Health and Hygiene, London

1 63 124 (Nov.) 1937

- *Osteo-Arthritis. T. J. O'Reilly—p. 73
 The Management of the Difficult Child. D. R. MacCalman—p. 93
 Diet and Dietetic Indiscretions After Infancy. W. Sheldon—p. 97
 The Development of Physical Education for Women and Girls in This Country. P. Spafford—p. 103

1 125 184 (Dec.) 1937

- The Posterior Lobe of the Pituitary. I. Posterior Lobe of Pituitary. II. Anterior Lobe of Pituitary. III. Sex Hormones. E. C. Dodds—p. 135
 Assessment of Subnutrition and Allied States. G. D. Morgan—p. 154
 Empire Campaign Against Rheumatism. F. Fox—p. 163
 Canned Foods in Relation to National Defence. F. Hirst—p. 171

Osteo-Arthritis—O'Reilly calls attention to the fact that the joints of the body are affected by osteo arthritis in a constant and peculiar manner. The distribution of the disease is regular and limited. It is confined to the hip joint, the knee joint and the joints of the lower part of the spine. A disease with such constant incidence in the body must have an anatomic path of spread. The lymphatic connections of the joints provide

this path. A pathologic process affecting the iliac glands has a direct anatomic and physiologic base for producing this disease in a manner that is in agreement with its clinical manifestations. An examination was made of the iliac glands, recovered at necropsy. These showed chronic inflammatory changes with fibrosis and occasional focal calcification in the fibrotic areas. These calcified areas have already been noted in the x-ray study. In some of these cases an examination was made of glands from the popliteal and epitrochlear spaces. No changes were found in them except fatty atrophy. The iliac glands are directly connected with and receive lymph from the inguinal glands, and it seemed probable that a cause would be found there. A search for the cause of inflammation in the inguinal glands showed a constant lesion in the feet in all the author's cases—the "erosio interdigitalis" of Fabry. It seems probable that osteo arthritis is a slow degeneration of the tissues of the hip joint, knee joint and joints of the lower part of the spine dependent on chronic inflammatory changes in the lymphatic connections of these joints and caused by a mycotic infection of the skin of the feet. This form of infection of the feet is very prevalent. It was found in 38 per cent of 200 patients suffering from a variety of conditions not including osteo-arthritis, and its prevalence increases with age. An explanation of the age onset of osteo arthritis may be found in the fact that the disease process is a slow one confined for a time to the inguinal glands and that a period of years is necessary following infection before sufficient damage is done to the iliac glands to affect the joints. Osteo arthritic changes vary from the simple lipping which is frequently present in the metacarpophalangeal joint of the great toe, and which must be regarded as a physiologic response to constant trauma, to the more advanced ones that follow gross trauma, gout, rheumatoid arthritis and other joint conditions. The treatment of infected feet in the early stage before changes in the joint have supervened should eliminate this disease. Treatment of the infected feet must be continued for several months before the focus of the disease is eradicated. Mycosten—para-oxo-benzoic acid-ethyl-ester—introduced by Lomholt in 1934 has been found to be the most effective application for the interdigital lesion. The toenails, when mildly infected, will respond to treatment with Whitfield's ointment, to which 1 per cent of thymol is added. Grossly diseased nails are better removed. Sweating of the feet on walking, a characteristic symptom of active infection, disappears with its cure.

Journal of Tropical Medicine and Hygiene, London

40 277 292 (Nov. 15) 1937

- Diseases of the Skin in Negroes. L. J. A. Loewenthal—p. 277
 Sprue and Pernicious Anemia. A. Castellani—p. 281

40 293 312 (Dec. 1) 1937

- A Short General Account for Medical Men of Genus Monilia Persoon 1797. A. Castellani—p. 293

Lancet, London

2 1177 1232 (Nov. 20) 1937

- Physiology as a Part of General Education. L. P. Lockhart—p. 1177
 Sarcoma of the Uterus. R. S. Handley and J. Hawkins—p. 1180
 The Newer Electrocardiogram Denoting Right Bundle Branch Block. W. Evans. Pathologic report on case 7 by H. M. Turnbull—p. 1184
 *Further Experience with Heparinizing the Donor in Blood Transfusion. P. Hedenius—p. 1186
 Therapeutic Trials on Pellagrins in Egypt. P. Ellinger, A. Hassan and I. M. Taha—p. 1188
 Gastromegaly Due to Arterio-mesenteric Obstruction of Duodenum. S. Campbell—p. 1190
 *Hydrogen Ion Concentration of Human Blood Plasma in Respiratory and Cardiac Disease. Cecilia Shishin—p. 1191
 Serologic Grouping and Typing of Hemolytic Streptococci from Various Human Sources. Constance Shaw—p. 1193

Heparinizing the Donor in Blood Transfusions—In the opinion of Hedenius the following conditions should be fulfilled in an ideal blood transfusion: (1) the technique should be so simple that no lengthy preparation or large staff is necessary; (2) it should not injure the donor or recipient; (3) it should be possible to transfer the desired amount of blood; (4) it should be possible to perform the transfusion with the donor and recipient in separate rooms; and (5) whole blood should preferably be used. The method of blood transfusion (abstracts of articles on heparinizing the donor appeared in THE JOURNAL July 18 and Sept. 26, 1936, pp. 246 and 1007).

that he described a year ago has been tested and found valuable in more than 150 transfusions. The procedure is now used as a routine in Surgical Clinic No 11 and Sabbatsberg Hospital, having replaced the citrate and whole blood methods. The transfusions in 50 per cent of the cases were performed during or within the first six hours after operations causing anemia. Transfusions were effected in 20 per cent of the cases because of postoperative complications (hemorrhage sometimes combined with septic conditions) especially after cancer operations, in 5 per cent because of bleeding ulcers of the stomach, in 15 per cent because of chronic septic conditions and in 10 per cent because of serious anemia of pernicious or chronic secondary type. In 3 per cent of cases the transfusions were done before serious operations. By injecting the donor with a sterile solution of heparin before taking the blood, one can obtain noncoagulable blood for a certain length of time, depending on the amount of heparin injected. The blood obtained is whole blood and has no anticoagulant effect on the recipient's blood. Since heparin of a constant strength and purity may now be obtained and may be bought in sterile solutions (up to 5 per cent), there is no longer any difficulty in dosage. To obtain a distinct prolongation of the time of coagulation, a certain threshold dose must be exceeded. This is about 0.25 mg per kilogram of body weight when heparin is given intravenously. The transfusion should be done within half an hour of the injection and with this time limit 1 mg of heparin per kilogram of body weight of the donor will be required. The method fulfils all the requirements of an ideal procedure for blood transfusion. It allows the use of whole blood in its natural state and does not involve the use of any substances foreign to the body. It has all the advantages of the citrate methods but none of the disadvantages, such as a possible excess of anticoagulant when the expected amount of blood is not obtained. The transfusion can be performed with any equipment available and the technic should prove of value particularly in performing transfusions away from hospitals.

Hydrogen Ion Concentration of Blood Plasma in Respiratory and Cardiac Disease—Shiskin examined 160 samples of blood from 150 patients with respiratory and cardiac disease for their pH values. Almost always the samples were primarily collected for other hematologic examinations. Thus the cases represent a varied collection, including all forms of cardiac disease—rheumatic, syphilitic, hypertensive and degenerative. In the respiratory group are cases of pneumonitis, tuberculosis, bronchiectasis, asbestosis, catarrhal conditions and neoplastic disease. In twelve control subjects examined the pH varied from 7.39 to 7.43, with an average of 7.4. In the 160 pathologic samples examined a much wider range is observed—from 7.31 to 7.58. Most of the values lie between 7.4 and 7.44. There was no characteristic pH for any particular disease. The average for pulmonary tuberculosis was almost identical with the average for neoplasm, while the average for chronic pulmonary suppuration differed little from that for renal disease. In cases of mitral stenosis and aortic disease the average pH of patients with cyanosis was lower than that of the patients without cyanosis. This difference between cyanotic and noncyanotic patients was not observed in the cases of cardiovascular degeneration. Increased pulmonary ventilation appeared to increase the alkalinity of the blood, as also did pyrexia. The pH did not vary with sex or age or an increase or decrease in the pulse rate. The present observations are in accord with those of other workers. While in a few cases wide variations in the pH value of the blood were observed it appears that unless there is gross interference with the hemorespiratory exchanges the normal buffers of the blood are adequate to deal with changes in the acid-base equilibrium. The increase of acidity in mitral disease associated with cyanosis—a condition usually regarded as inimical to tuberculosis—is of possible significance.

South African Medical Journal, Cape Town

11 751 790 (Nov. 13) 1937

- Why Patients Die After Surgical Interference I Surgical Aspect W
Welchman—p 753
Id. II The Medical Aspect. A L Agranat—p 759
Two Remarkable Cases L J te Groen—p 766
Bacillus Coli Infections of the Urinary Tract V Vermooten—p 767
New Treatment of Pulmonary Tuberculosis H S Maguire—p 770

Annales de Médecine, Paris

42 581 668 (Dec) 1937

- Clinical and Roentgenologic Aspects of Pulmonary Abscess in Children and Nurslings R Dehre J Marie M Lamy, M Mignon J Bernard and S Bidou—p 581
*Role of Cholesterol and of Cholic Acid Respectively in Pathogenesis of Biliary Lithiasis E Chabrol J Cottet and M Cachin—p 607
Roentgenologic Aspects of Acute Pulmonary Edema M Lelong and J Bernard—p 624
Disorders of Myocardial Function Fractionated Systoles R Lutembacher—p 636
*Exophthalmic Goiter a Disorder of the Sympathetic Nervous System Influence of Sympathetic Nervous System on Basal Metabolism E I Cohen—p 644

Cholesterol and Cholic Acid in Pathogenesis of Biliary Lithiasis—Chabrol and his associates review the literature on the role of the biliary salts, the fatty acids and cholesterol in the development of biliary lithiasis and report their own investigations on this problem. In studying *in vivo* the relations between cholesterol and cholic acid they direct attention to the inconstancy of hypercholesterolemia in patients with biliary lithiasis. They show that there is no excess of cholesterol in the gallbladder of patients with lithiasis and that there is no balance in the hepatic excretion of cholesterol and of cholic acid. They report *in vitro* studies on the relations between cholesterol and cholic acid and demonstrate that the cholesterolytic power of the bile of dogs is not strictly dependent on its initial cholesterol content or on the cholic acid content. They report studies on the relation of cholesterol and of cholic acid to the biliary hydrogen ion concentration and then inquire whether the elective absorption of the biliary salts by the vesicular wall leads to the formation of calculi of cholesterol. They point out that it would be exaggerated to reduce the pathogenic problem of lithiasis to a balance of cholesterol and of cholic acid, in other words to a selective insufficiency of the biliary salts. The deficit of the fatty acids also plays its part by disturbing the unstable emulsion of colloids and cristalloids, on the other hand, the amount of secreted albumin and the variations in the pH caused by the acidifying microbes may precipitate the cholesterol without necessarily acting on the cholic acid. Whether stasis of the gallbladder, which facilitates infection, or hepatopancreatic insufficiency with its disturbing influence on the metabolism of fats, pigments and biliary salts is incriminated, in all the hypotheses the problem of lithiasis is dominated by the notion of colloidal disequilibrium. Closely united in their destiny, cholesterol and cholic acid seem to undergo this disturbance more often than they cause it by their excess or by their deficit.

Exophthalmic Goiter Influence of Sympathetic on Basal Metabolism—Cohen shows that experimental investigations demonstrate the influence of the sympathetic on the cellular oxidations, the fundamental unit of the basal metabolism. This influence is confirmed by the following facts:
1 It was observed by Marine that in thyroidectomized animals the injection of epinephrine elevates the basal metabolism.
2 Studies by Abderhalden and Wertheimer proved that ergotamine neutralizes the effect of thyroxine.
3 The substances that modify the tonus of the sympathetic modify at the same time the basal metabolism. Likewise, the thyroid and the adrenal medulla act by modifying the tonus of the nervous system, they do not have a direct action on the oxidations. Under these conditions the basal metabolism can no longer be considered as a test of the thyroid activity but rather as a test of the activity of the sympathetic. All the symptoms of exophthalmic goiter are sympathetic signs, among them the augmentation of the basal metabolism. The diverse forms of the syndrome of hyperthyroidism do not all have the same endocrine cause. They vary according to the mode of pluriglandular disturbances, among which the thyroid factor is frequent but not indispensable. The lesion of the sympathetic may be the origin of the syndrome and of the pluriglandular dysfunction. Consequently, neither from the symptomatologic nor from the pathologic point of view can the syndrome of exophthalmic goiter any longer be counted among the dysfunctions of the thyroid. It is a sympathetic amphotony.

Presse Medicale, Paris

45 1771 1794 (Dec 11) 1937

- *Human Thyroid Graft in Case of Infantile Myxedema R Le Fort—p 1771
- *Azotemia in Experimental Diphtheritic Intoxication of Guinea Pigs J Chalier, M Jeune and L Revol—p 1773
- Vitamin C Requirements in Human Subjects A Giroud, R Ratsimamanga M Rabinowicz and E Hartmann—p 1774
- Disturbances in Mineral Equilibrium and Adrenal Insufficiency R Junet and E Martin—p 1775

Thyroid Graft in Infantile Myxedema—Le Fort reports the history of a child who, in 1925 at the age of 2½ years, showed the symptoms of myxedematous idiocy. There was severe deficiency, perhaps complete absence, of thyroid secretion. Palpation of the neck gave no indication of the presence of a thyroid. It was decided to try transplantation of human thyroid tissue. About one half of the right lobe of the thyroid was obtained from an executed criminal and about two thirds of this tissue was immediately transplanted into the abdominal rectus muscle of the child. The author describes the post-operative course and the changes that took place in the child in the years following. Four days after the operation the child had lost much weight and its facial expression was already greatly changed. Dentition, which had been greatly retarded before the intervention, was accelerated. The modification of the intelligence was surprising. From the point of view of the physical and mental development, the efficacy of the thyroid graft was gradually lessened as the years advanced. Examination in November 1936 revealed that the child, now 14, showed the development of a child of 9. However, the development, although slow, had not ceased.

Azotemia in Experimental Diphtheria—Chalier and his associates point out that an increase in the urea content of the blood is frequent in malignant diphtheria and that it is of prognostic significance in that, if the urea content reaches or exceeds 1 Gm, the disease is almost certainly fatal. To verify this clinical observation, the authors decided to make experiments on animals. They selected guinea pigs for experiments, because of the extreme sensitivity of these animals to diphtheritic intoxication. First they determined the frequency of azotemia in the experimental diphtheritic intoxication of guinea pigs. They found that the urea content was increased in all the inoculated animals. They gave attention to the origin of the azotemia, pointing out that some authors have doubted its renal origin. They themselves were able to demonstrate that the diphtheritic azotemia is not entirely of adrenal origin, for they observed animals with severe azotemia in which adrenal changes were absent. On the other hand, they show that certain renal lesions are without doubt the basis of the diphtheritic azotemia. After reporting their observations on the severity of azotemia in the different forms of experimental diphtheritic intoxication, the authors evaluate the prognostic significance and find that the intensity of azotemia reflects exactly the severity of the intoxication. Of twelve animals with high azotemia only one survived, and of eighteen animals with moderate azotemia only one succumbed to the intoxication.

Schweizerische medizinische Wochenschrift, Basel

67 1173 2004 (Dec 11) 1937 Partial Index

- Action of Plant Pigments on Injured Skin E Burgi—p 1173
- Does Prolonged Cure by Insulin Justify Hope of Amelioration of Diabetes? P Mauriac—p 1176
- *Lamblasis and Its Treatment with Atabrine B Galli-Valerio—p 1181
- Comparison of Various Treatments for Migraine Mary E O Sullivan and Viola T Raybin—p 1182
- *Staphylococcus Toxoid R Montant and G Deruaz—p 1184
- *Intracarotid Injections of Bacteriophage for Treatment of Furuncles of Nose with Beginning Extension Toward Cavernous Sinus J Steinmann—p 1189
- Poisoning with Mushrooms (Amanita Phalloides) Four Cases E Bernhard Kreis—p 1192

Treatment of Lamblasis—Galli-Valerio says that infection with *Lamblia intestinalis* is not limited to the warm countries but that it occurs also in Switzerland. It causes alternately diarrhea and constipation, also inflation of the abdomen, often with pains, disturbances of the appetite and the digestion disorders of the biliary secretion with pains in the region of the liver, general prostration and often depression. The dissemination of lamblasis takes place by the elimination of the cysts in the fecal matter. The flagellated forms

are only rarely found in the feces, while they are detected in large numbers in the liquid obtained by duodenal catheterization. The author points out that in the past the treatment encountered considerable difficulties. Therapeutic attempts were made with arsphenamine, methylene blue, emetine hydrochloride and other substances, but the results were either negative or only partly satisfactory. Chimofofon was also tried with little success. In view of the energetic action of the acridine preparation atabrine on the malarial parasites, it was decided to try this substance in the treatment of lamblasis. The author as well as several other investigators obtained favorable results with this acridine preparation in lamblasis. The substance was given in the doses used in malaria and it was found effective even in the severe cases of lamblasis. The conclusion was reached that treatment with atabrine is the method of choice in lamblasis, its action is complete and reliable, its toxicity is slight and its administration is simple.

Staphylococcus Toxoid—Montant and Deruaz found that the injection of the toxoid always produces a severe local reaction. If no precautions are taken, the general reaction may be violent. The intradermal reaction indicates the allergic state of the patient. The intradermal reaction must be practiced systematically because it determines the posology. The authors perform the intradermal reaction with 0.1 cc of solution of toxoid. The posology is influenced likewise by the absence or presence of nephritis, of diabetes or of constitutional defects. The presence of a leukopenic reaction after the first injection makes extreme caution necessary. For the first subcutaneous injection the authors use 0.1 cc and even less. Later they administer 0.25, 0.5, 1 and 2 cc. By the time the dose of 2 cc has been reached, the disorder is usually cured, if not, this dose may be repeated at weekly intervals. In cases which demand caution, the increase in the dose should be slow (0.1, 0.2, 0.4, 0.8 and 1 cc). Staphylococcus toxoid is a specific. It cures only specific disorders. This explains the cure of the pustules of polymorphic acne and not of the acne itself. The injection of toxoid acts rapidly on the inflammation of the tissues, the toxoid surrounds the foci and causes the prisms to disappear. Toxoid has the power to elevate for forty-eight hours the leukocyte count of the blood. The treatment with toxoid imposes on the cutaneous staphylococci a particular development, characterized by an arrest in the maturation of the elements with prolonged persistence of perifollicular induration. The general therapeutic reaction of toxoid vaccination depends on the causal staphylococcal disorder. The best results are obtained in hidrosadenitis. Acute and chronic furunculoses are rapidly cured. Relapses are not frequent. Refractory furunculoses are cured at the time of the first treatment, but the preventive effect is uncertain. A case of chronic osteitis of the distal phalanx was rapidly cured, but chronic perionychia seemed hardly improved.

Intracarotid Injection of Bacteriophage—Steinmann reports two cases of staphylococcal infection of the nose with extension toward the cavernous sinus, in which he resorted to the intracarotid injection of almost totally deproteinized bacteriophage. The clinical history of the first patient indicates that at the first intracarotid injection only 3 cc of the auto-bacteriophage was given, but at the later injections 20 cc was administered without secondary reactions. The second patient was given several injections of 10 cc each. In both patients the intracarotid injections of the autobacteriophage proved effective, they produced rapid cure. The author recommends this treatment for similar cases.

Minerva Medica, Turin

2 609 640 (Dec 9) 1937

- *Lymph Nodes in Primary Chronic Rheumatism A M Michelazzi—p 609
- *Significance and Importance of Roentgen Diagnosis of Esophageal Varieties in Splenomegaly G Lenarduzzi and G Chiorizzo—p 613
- Critical Study of Case of Acute Myelosis with Intense Leukopenia Anemia and Thrombocytopenia E Massobrio—p 617
- Calcemia in Patients with Varicose Veins C Colombo—p 627
- Behavior of Weltmann's Reaction in Cancer E Tagliaferro—p 629

Lymph Nodes in Primary Chronic Rheumatism—Michelazzi made microscopic studies of the paratracheal lymph nodes in two cases of primary chronic rheumatism of the ankylosing type without splenomegaly in adults. He found

that there is an intense reaction of the germinative centers of the lymphatic follicles with proliferation of reticulo endothelial cells, subcapsular and intracapsular plasmacellular infiltration, catarrh of the sinuses of the nodes, proliferation of the endothelial walls of the glandular sinuses, increase of the argentophil cells of the lymphatic cords and of the sinuses of the nodes and intravascular alterations of a granulomatous type. The alterations of the lymph nodes in primary chronic rheumatism seem to be the link between those in Still's disease and those in acute polyarthritis. From a clinical point of view the condition can be compared to the Still's disease without splenomegaly. Microscopic preparations of the bone marrow, taken by sternal puncture in one of the author's cases, showed that there is a reticulo endothelial, plasmacellular reaction of the type which is seen in a variety of Still's disease (Felt's). The alterations of the bone marrow in these cases are identical to those which take place in the blood in the course of rheumatic fever, in certain forms of chronic rheumatism with splenomegaly and in the lymph nodes and the spleen in acute polyarthritis. According to the author, the disease of the para-articular lymph nodes in rheumatic diseases is independent of the chronic, acute or subacute types of rheumatism. It is due to a general pathologic condition of the reticulo endothelial system which involves, selectively, the para-articular lymph nodes of the rheumatic joints and sometimes also the bone marrow and the spleen.

Roentgen Diagnosis of Esophageal Varices in Splenomegaly—According to Lenarduzzi and Chiorazzo, the presence of varices in the lower segment of the esophagus in roentgenograms taken in the course of autochthonous splenomegaly without hepatic complications shows that splenomegaly is of the fibrous congestive type. In this type of splenomegaly there is a primary disorder of the splenic circulation with consequent stasis of the blood in the spleen, which is followed by the establishment of a collateral circulation, early in the course of which the esophageal varices appear. The treatment consists in splenectomy or ligation of the splenic artery, which is advisable as soon as possible after establishment of the roentgen diagnosis owing to the fact that the patient is menaced by the production of intense hemorrhages of varicose origin or by complications of the liver. The operation in certain instances is followed by the disappearance of the esophageal varices from the recently taken roentgenograms. When thrombosis of the gastric coronary vein exists, the varices are not modified. Even in these cases splenectomy is of value, as it prevents further disturbances of the portal circulation, the hemorrhagic diathesis and the cirrhotic influence of the congested spleen on the liver. According to the author the esophageal varices are the result of the association of stasis of the splenic blood with that of the liver and of the various territories of the stomach. It is still unknown why in certain cases a gastro-esophageal stasis prevails whereas in other cases there are functional disorders and inflammation of the pyloric and duodenal segments with formation of local ulcers. The authors report four cases.

Rivista di Patologia e Clin d Tuberculosis, Bologna

11. 809 896 (Nov 30) 1937

Systematic Clinical and Roentgen Researches of Thorax of School Children. G. Costantini—p 809

Comparison of Pulmonary Tuberculosis in Children and in Adults. Conception of Pretuberculous Lesions. O. Maestri and A. B. Silarata—p 817

Studies and Researches on Pneumothorax. O. Cantoni—p 851

Rare Modality of Tuberculosis with Perforation of Small Intestine. Case. B. Galavotti and P. Diletti—p 858

Intestinal Tuberculosis with Perforation of Small Intestine—Galavotti and Diletti say that an ulcer in intestinal tuberculosis may be perforated into the free peritoneum and cause acute peritonitis. Early diagnosis of the perforation, when peritonitis is still incipient, is of importance. The treatment is surgical and of emergency. It consists in suturing the perforation and making an omentocleisis. Resection of the perforated intestinal segment is a serious operation which cannot be endured by the patient. The authors' patient, aged 71 years, had a history of intestinal tuberculosis of about six years duration. She entered the hospital in a grave condition with acute peritonitis from two perforations of the small intestine into the free peritoneum as a complication of tuberculous enteritis. The perforations occurred at the distal segment of

the jejunum and the jejunal-ileac segment and were sutured in one operation. The authors found on necropsy that tuberculosis existed only in the intestine, mesentery and regional intestinal and mesenteric lymph nodes and hilus of the liver. There were old and recently developed tuberculous lesions. The old ones consisted in thickening of the intestine and mesentery, presence of cicatricial tissue in the structures and a process of chronic tuberculosis, adenitis and periadenitis. They showed the primary infection of tuberculosis. The new lesions were ulceration of the intestinal mucosa and submucosa, infiltration of the intestinal wall and presence of epithelial necrotic nodules in the intestine, the mesentery and the regional and mesenteric lymph nodes. The small intestine was perforated in zones of ulcerations which had formed near the old lesions. The authors believe that in their case there was a primary tuberculous infection which simultaneously developed at two different points of the small intestine and mesenteric lymph nodes as chronic tuberculosis. Later on, a retrolymphogenic reinfection took place with consequent development of an acute type of secondary tuberculosis which caused first ulceration and then destruction of the intestinal walls. The intestinal ulcerations were a prelude for further perforation of the intestinal wall.

Semana Médica, Buenos Aires

44. 1305 1360 (Dec 9) 1937. Partial Index

*Tuberculin Treatment in Asthma. J. J. Viton, J. Gallo and D. J. J. Martinez—p 1305

Surgical Treatment of Megacolon. A. S. Introzzi—p 1316
Spiritual and Medical Prevention of Antiveneal Diseases. N. V. Greco—p 1328

*Circumscribed Early Infiltration. O. P. Aguilar and C. Bancalari—p 1329

Abdominal Abortion in Traumatic Detachment of Fundus Uteri. T. Areta—p 1344

Tuberculin Treatment in Asthma—Viton and his collaborators state that asthma is as frequent in children as it is in adults and that in the majority of the cases it is of tuberculous origin. The history of the patients and the roentgen study of the thorax frequently show chronic bronchopulmonary disturbances or tuberculosis. The negative skin reactions to tuberculin and the absence of tubercle bacilli in the sputum do not exclude the etiologic role of tuberculosis. Tuberculin is the specific treatment. It is administered in ultrasmall doses (Viton's method). Although the dose is not specified, the authors say that tuberculin is administered in weak solutions to prevent the strong reactions which may follow. It is advisable to use tuberculin before resorting to any other treatment. The authors report the clinical and roentgen study of the evolution of asthma and the conditions of the lungs and bronchi before and after tuberculin treatment in six adults who were suffering from asthma.

Circumscribed Early Infiltration—Aguilar and Bancalari state that early infiltration of the lung frequently occurs at the onset or reactivation of pulmonary tuberculosis in adolescents and adults. It is a circumscribed or diffuse subclavicular infiltration, which generally develops in the subapical region or the middle zone of the lung, especially on the right side. It has a tendency to ulcerate and develop into early cavitation of the lung. The type of early tuberculous infiltration is different from Redeker's perifocal infiltration, early (primary) infiltration of children and anergic adults and the types of metastatic (secondary), late (tertiary), round (Fraenkel's) and transient tuberculous infiltration. It is graver than other forms of tuberculous infiltration. It is frequent in adolescents and adults who live in close association with patients who are suffering from pulmonary tuberculosis. As symptoms appear late in the evolution of the condition, the patients report for examination of the thorax after cavitation or spread of the lesion has taken place. The authors point out the importance of making systematic roentgen examinations of the thorax of persons frequently associated with patients who have pulmonary tuberculosis. The diagnosis of the condition is exclusively roentgenologic. In the majority of cases the infiltration develops into cavitation. In some cases it is reabsorbed and stabilized or it passes to processes of fibrosis or calcification. Collapse treatment is indicated if administration of gold salts fails to heal the infiltration after three or four months. The authors study the onset, localization and evolution of the lesion in three cases.

Deutsches Archiv für klinische Medizin, Berlin

181 125 228 (Nov. 25) 1937 Partial Index

- *Gangrene of Lower Extremities in Patients with Diabetes Mellitus H Dibold and L Falkensammer—p 125
- *Action of Venesection in Hypertension S Lauter and A Ott—p 139
- Observations on Subacute Myeloblastic Leukemia W Tischendorf—p 147
- Electrocardiogram and Heredity H Hecht and I C Gupta—p 160
- Fat Deposits and Fat Distribution in Persons of Normal Weight S Lauter and A Terhedebrugge—p 181

Gangrene of Lower Extremities in Diabetes Mellitus

—Dibold and Falkensammer observed forty diabetic patients with gangrene of the lower extremities. They found that the level of the blood sugar of the fasting patient does not permit a prognostic evaluation. However, considerable increase of the blood sugar in the course of the treatment is a sign of progressive gangrene. Acidosis is of less importance in gangrene than in other inflammatory processes of patients with diabetes. Metabolic equilibrium is essential for the success of the treatment of diabetic gangrene. Exact anatomic analysis of the vascular processes is of no importance for the clinic. In all the diabetic patients whom the authors subjected to surgical treatment, roentgenoscopy disclosed calcium deposits. The terminal stages of gangrene are frequently the result of new arterial thromboses. Patients with a blood pressure of 200 mm of mercury and with hemorrhages in the fundus oculi have an unfavorable prognosis. The first task of the local treatment of diabetic gangrene is to dry the gangrene. Ointments that contain cod liver oil signify an advantage over older methods. Regarding the treatment of the vascular disorder, the authors state that they obtained favorable results with an extract from cardiac muscle (Iacarnol) and with a pancreatic extract (padutin). They found the latter especially valuable, so that they would not dispense with it. They do not think that advanced vascular defects can be counteracted by the pancreatic extract, but they found that it controls the pains. In contradistinction to other investigators, the authors do not regard diabetic gangrene as an indication for insulin treatment, for they acknowledge only the metabolic action of insulin and do not consider it an aid to the treatment of wounds, in fact, they think that insulin is to a certain extent contraindicated in cases of vascular damage. On the basis of numerous clinical observations, they conclude that diabetes favors the development of arteriosclerosis and they suggest that a search should be made for common causes of diabetes and arteriosclerosis.

Action of Venesection in Hypertension—Lauter and Ott point out that in many cases of cardiac decompensation, renal diseases, hypertension and so on the action of venesection is so impressive and the subjective relief is so convincing that venesection can hardly be dispensed with. However, the opinions about the mode of action of venesection are still divided. Because they had observed that the hemoglobin value and the number of erythrocytes often decreased considerably and because there were indications which suggested that the reduction in hemoglobin was caused by other factors besides venesection, the authors decided to study the effects of venesection on patients with hypertension and on persons with normal blood pressure. Before and after venesection they determined repeatedly the quantity of the circulating blood and the blood pressure and they examined the blood picture. They found that the circulating quantity of blood is more or less reduced by venesection. This reduction is in many instances more noticeable than the extent of the venesection would warrant. This excessive decrease in the circulating amount of blood is the result of transfer into the blood depots. The function of the depots consists in storage of erythrocytes and hemoglobin. In order to determine to what extent the spleen is involved, further studies will be required. Whether the extent of the venesection exerts an influence could not be decided on the basis of the reported experiments. The flow of serum from the tissues and into the blood stream regularly produces a thinning of the blood after venesection. The flow into the depots is apparently produced by reflex action, it takes place also after rest in bed, but this effect is more noticeable after venesection. The reported studies revealed no relationship between the changes in the blood pressure and those in the quantity of the circulating blood.

Zeitschrift für das gesamte experimentelle Medizin, Berlin

101 451 584 (Oct. 20) 1937 Partial Index

- Influence of Ferments on Tissue Sections H Groll—p 451
- Electrocardiographic Changes in Heart Tamponade W Ostrowski and I Pines—p 465
- *Examination of Hemoglobin Compounds with Aid of Infra Red Photography A Weinbach—p 477
- Pneumotachographic Investigations on Healthy Persons on Patients with Emphysema and on Patients with Heart Disease in the Bath K Rumpf—p 493
- *Significance of Coprophagy in Young Rats That Are Fed with Cow's Milk K Schwartzer—p 502
- *Blood Protein Picture and Its Significance for Mechanism of Takata Reaction W Gros—p 519

Examination of Hemoglobin with Infra-Red Photography—Weinbach, in reviewing the uses to which infra red photography has been put, points out that it is used in criminology for the detection of forgeries of passports and letters and that it has been helpful in the textile industry, in the optical sciences, in plant pathology, in zoology and also in various branches of medicine. Eggert demonstrated that by means of infra-red photography it is possible to differentiate between normal blood and that containing carbon monoxide. Fröhlich and Radenacker made further investigations on this problem and demonstrated that infra-red photography is a more sensitive method for the detection of carbon monoxide hemoglobin than is the spectroscopic method. The author decided to use infra-red photography for the examination of oxyhemoglobin, carbon monoxide hemoglobin, methemoglobin, hemtoporphyrin and cyanhemoglobin. In his investigations on oxyhemoglobin and carbon monoxide hemoglobin he was able to corroborate the results obtained by Eggert, Fröhlich and Radenacker. His studies on the other hemoglobin compounds revealed that methemoglobin has the greatest absorbing power for infra red light and that cyanhemoglobin and hemtoporphyrin have the same absorbing power as oxyhemoglobin. He suggests the possibility of preparing infra-red spectrums and thinks that the examined hemoglobin compounds will present characteristic absorption bands in the infra-red spectrum.

Significance of Coprophagy in Experiments on Rats—Schwartzer directs attention to the fact that coprophagy plays an important part in the development of young rats that are used for experiments on vitamins and anemia. He describes a device which makes it possible to prevent the rats from feeding on feces and urine. Fifteen animals that were kept in this device, while they were fed exclusively on cow's milk, soon became ill and lived on the average only ten days, whereas eight other animals, which could obtain feces and urine in addition to the cow's milk, survived twice as long. The author stresses that coprophagy is important for the problem of animal experiments on rats.

Blood Proteins in Takata Reaction—On the basis of experimental and clinical observations on the Takata reaction, Gros reaches the following conclusions: 1 The quantitative chemical analysis of the flocculation sediment in various diseases with positive Takata reaction disclosed a protein content of 80 per cent with traces of mercury. 2 In fifty instances of different disorders in which the Takata reaction was positive, it could be demonstrated not only that the positive outcome of the Takata reaction is dependent on a deviation of the albumin-globulin quotient in favor of the globulin but also that, in certain cases showing the same albumin content, the quantitative composition of the globulin fraction plays a part, namely, that the predominance of euglobulin is of decisive significance for the positive outcome of the reaction. The negative outcome of the Takata reaction, in spite of the predominance of the globulins, finds its explanation in other quantitative conditions within the globulin fractions, in that the euglobulin is not essentially involved in the augmented globulin content. Only when there is a considerable absolute increase in the globulin content is it unnecessary that there be a certain quantitative composition of the globulin fraction. 3 It was demonstrated by repeated examinations of the serum protein bodies in parenchymatous icterus and nephroses that the different outcome of the Takata reaction, in the same patient, is caused by reversible changes in the composition of the serum protein bodies. 4 The negative outcome of the Takata reaction after severe hemorrhages in hepatic cirrhosis is caused by an inflow of albumin into the blood which is

accompanied by a decrease in the globulin fraction. This shifting in the blood protein picture may be compensated in the course of several weeks. 5 The Takata reaction is not absolutely specific for hepatic disorders, for it is positive also in disorders without demonstrable impairment of the hepatic parenchyma. 6 Nonhepatic disorders in which positive Takata reactions may occur include Hodgkin's disease, myeloid leukemia, bronchial carcinoma, syphilitic mesoarteritis and endocarditis. 7 The results of flocculation are dependent on the time that has elapsed at the time of reading. In order to obtain uniform results, the reading should be taken after twenty-four hours and the reaction should be designated as positive only if a flocculated sediment is demonstrable from the third tube on and is visible in three or more successive tubes.

Zeitschrift für klinische Medizin, Berlin

132 705 828 (Oct 14) 1937 Partial Index

- *Demonstration of Castle's Ferment in Gastric Juice During Anemias R E Mark and G Hauke—p 705
Electrocardiographic Investigations on Cardiac Action of Remedies with Vasodilatory Action on Coronary Vessels R Fischer and L Zwiilinger—p 717
Studies on Normal and Pathologic Physiology of Motility of Human Stomach F Brauch—p 733
Formation of Urea and Oxygen Consumption of Isolated Liver. Specific Dynamic Action of Amino Acids K Oberdisse and M Eckardt—p 762
Investigations on Action Mechanism of Othrosil in Experimental Streptococcal Infections G Domagk—p 775
*Multiple Myelomas and Viscosity D Albers—p 807

Castle's Ferment in Gastric Juice During Anemias—Mark and Hauke point out that, with greater knowledge about the anemias, the differential diagnosis has become more difficult. It is no longer possible to consider a color index above 1 as indicative of a pernicious anemia, for hyperchromic anemias are known to occur also in some gastro-intestinal disorders, after gastric resections, in intestinal strictures, in certain cases of gastric carcinoma, in splenomegalic hepatic cirrhoses and so on. Moreover, clinical aspects resembling those of pernicious anemia are found also in hemolytic icterus. These and other difficulties in the differentiation of the various anemias were an inducement for the prompt acceptance of new methods of differentiation, especially Castle's test on the gastric function. A review of the literature on Castle's principle convinced the authors that it has not been definitely demonstrated that the intrinsic factor is the eliciting cause of the reticulocytic reaction in rats. They decided to make further studies. They found that the subcutaneous administration of 5 cc of normal gastric juice (obtained after injection of histamine) to white rats weighing between 160 and 220 Gm is a practical reaction for the production of a reticulocytic crisis. In case of a deficiency in hydrochloric acid, without disease of the blood, this reaction is usually positive. In obscure, hypochromic anemias it may be normal or subnormal. In achlorhydric anemias it was lacking. In hyperchromic anemias not of the pernicious type the reticulocyte reaction in rats was positive, but in an aplastic anemia it was negative. In all cases of pernicious anemia, whether examined before or after liver therapy, the reticulocyte reaction in rats was absent. In funicular myelitis after pernicious anemia, when the blood status was normal, the outcome of the reaction changed. As regards the differential diagnostic value of the reticulocytic reaction in rats, these studies prove that a positive reticulocytic reaction in rats generally speaks against a pernicious anemia but that the negative outcome is not a pathognomonic sign for pernicious anemia. Even in funicular myelitis the outcome of the reticulocyte reaction in rats does not definitely indicate whether the nervous disorder is the result of pernicious anemia or a disease by itself. The reaction cannot be used for the demonstration of Castle's ferment, because in achlorhydric anemia, for instance, Castle's test will be positive, but the reticulocytic reaction on rats may be negative in the same condition. Thus the reticulocytic reaction on rats must be regarded as a nonspecific reaction. Further investigations will be necessary to determine the nature of the substance which is present in normal gastric juice and elicits the reticulocytic crisis in rats.

Multiple Myelomas and Viscosity—Albers directs attention to the peculiar aspects of the blood in patients with myeloma and then reports his own studies on the viscosity of the blood of three patients with multiple myeloma. The viscosity

was increased in all three cases, but in two of them the viscosity values surpassed all hitherto observed values. In both of these cases the globulin fraction of the serum was greatly increased, whereas this fraction was only slightly increased in the third patient, in whom the increase in viscosity was not so severe. The viscosity in the two aforementioned cases did not, as is the case in other serums and in whole blood, decrease as the temperature increased but rather decreased several times as much. This fact makes it possible to avoid diagnostic difficulties. The considerable increase in viscosity is ascribed to the increase in the globulin content of the serum, which is important also for the appearance of Bence Jones protein bodies and for the increase in blood pressure.

Wiener klinische Wochenschrift, Vienna

50 1635 1666 (Dec 3) 1937 Partial Index

- Balneologic Treatment of Diseases of Urinary Organs H Rubritius—p 1635
Physical Therapy and Circulation N von Jagić—p 1637
Manifestations of Rheumatism and Climate A Laqueur—p 1641
Unusual Forms of Edema J Bauer—p 1644
*New Therapeutic Method in Myogelosis E Maliwa—p 1647
Depth Action of Short Waves Experiments on Models and Cadavers J Kowarschik—p 1649
Question of Acute Porphyrria W Loewenstein—p 1653

Therapy in Myogelosis—Maliwa says that the multiplicity of myogelosis, its appearance without muscular exertion or traumatic influences and its irregular distribution, with especial involvement of the musculature of the trunk, seem to indicate that an internal cause has a part. The two groups of general disorders in which myogelosis is most frequent are infectious arthritis and alimentary allergy. He is convinced that the combination with these disorders is not accidental but throws light on the pathogenesis and on the treatment. In comparing rheumatic and allergic diathesis and in searching for a common pathologic reaction, the author suggests that the increased irritability of the nervous apparatus of the blood vessels is a factor in the development of the muscular indurations. Discussing the treatment, the author points out that desensitization is indicated in myogelosis, whether it develops on the basis of an infectious arthritis or of an alimentary allergy. The author recommends the injection of sulfur in smallest doses for, as has been proved in allergic asthma, small doses of sulfur produce a nonspecific desensitization. The forms of myogelosis in which endocrine disorders are involved seem to originate in ovarian disturbances. General treatment in this form at the best arrests the further development of myogeloses but does not cause the existing myogeloses to disappear, to be sure, there is the possibility that they disappear spontaneously in the course of time. However, this does not make a local treatment superfluous. The author considers the energetic massage of the muscles, which was recommended by Fritz Lange in 1921, as the most effective treatment, but this method is too severe for some of the patients. Diathermy has been recommended, but without previous massage the author saw no noticeable benefits from it. He was disappointed also with the results of histamine iontophoresis and decided to try a new method. He injects into the myogelosis or into the tissue immediately adjoining it about 0.5 cc of a 0.5 per cent solution of procaine hydrochloride without epinephrine. Subsequently he injects at the same site a 1 per cent solution of sodium nitrite so that the total amount does not exceed 2 cc.

Klinicheskaya Meditsina, Moscow

15 919 1044 (No 8) 1937 Partial Index

- Mean Blood Pressure and Its Clinical Significance A I Yarotskiy—p 919
*Classification of Rheumatism E I Tsukershteyn—p 932
*High Altitude Sickness I V Basilevich—p 943
Modern Concept of Pain and Analgesic Effect of High Frequency Currents S S Lepskiy—p 955
Roentgen Therapy of Unresolved Pneumonia M E Mandelstam and V M Mints—p 964
Roentgen Therapy of Pulmonary Abscess M V Olkhovskaya and E Ya Bril—p 969

Classification of Rheumatism—According to Tsukershteyn the tendency to consider rheumatic infection as the result of individual reactivity to repeated introduction of antigens rather than as the result of action of a specific micro organism has undergone a modification in which the role of a specific

micro-organism is once more given an important place. Among the specific alterations not seen in any other disease are the Aschoff's nodes found in the myocardium. Rheumatism is a chronic intoxication which begins abruptly with an acute attack in childhood or in youth and which persists, as a rule, throughout life. Recurrences constitute a characteristic feature. Each new attack is the result of action of the specific provoking agent on a sensitized organism. Of the 300 cases admitted to the author's clinic, 82 per cent gave a history of recurring attacks. The lapse between the original onset and the first recurrence varied from that of a few weeks to one or more decades. While any organ or system may be involved, the central lesion is that of the cardiovascular system. Cardiac involvement is present at the first and at each ensuing attack. The author proposes a classification based on the character of the course of the disease so far as it affects the heart. He distinguishes four types according to the characteristics of the initial attack, and four forms presented by the ensuing recurrences. The types are (1) the arthritis, (2) the cardiac, (3) the choreic and (4) the lenta type, which is characterized by a severe and rapidly progressive course. These types may develop into the following forms: 1 Cardio-arthritis, which may be complicated by a glomerulonephritis in various stages or by pancarditis. The course may be benign or malignant. 2 Cardiac, characterized by a recurrence of myocarditis or pancarditis without joint symptoms. 3 Cardioresenal, with a progressive renal insufficiency leading to a uremic state. The course is, as a rule, malignant. 4 Cardiochoreic. In using the classification the author suggests that the type, the form and the course of the disease (benign or malignant) be indicated.

High Altitude Sickness—Basilevich experimented with healthy young subjects placed in an experimental chamber first under the conditions of normal atmospheric pressure and later in rarefied pressures corresponding to those obtaining at a height of from 3,000 to 5,000 meters. He was able to demonstrate that rarefying the atmosphere so as to correspond to that obtained at a height of 5,000 meters resulted in the reduction of percentage of oxygen saturation of the blood from the normal 94 to 100 to from 68 to 78 per cent. He concluded that the injurious effect of lowered atmospheric pressure on the human organism and the consequent development of altitude sickness are the result of oxygen deficiency which is manifested by arterial anoxemia. He felt that the fact that neither he nor the men experimented with developed any serious symptoms was due to the development of certain compensatory, regulating mechanisms. He was able to demonstrate that pulmonary ventilation and oxygen consumption increased from 50 to 100 per cent above normal figures. Among other compensatory reactions there was noted an increase in the pulse rate and in the systolic and minute volume of the heart, an increase in the oxygen utilization coefficient and an increase in the hemoglobin and the erythrocyte count. The author considers hypoxemia that develops as the result of hyperventilation of little importance in the development of the symptoms of altitude sickness. Oxygen inhalation is the main preventive and therapeutic measure. The altitude of 5,000 meters is the highest which man can reach unprotected. However, with training the tolerance can be increased.

Nederlandsch Tijdschrift v Geneeskunde, Amsterdam

81 5767 5890 (Dec. 4) 1937

- Vertebral Injuries. J. Van Eindhoven-Tenghergen—p. 5770
- Treatment of Thrombosis and Thrombophlebitis. H. Feriz—p. 5777
- *Measurement of Mean Diameter of Erythrocytes and Its Value in Hepatic Disorders and Icterus. L. Schalm—p. 5786
- Treatment of White Asphyxia in the New Born. N. J. F. Pompe Van Meerdervoort—p. 5795
- *Benzedrine Sulfate as Brain Stimulant. A. M. Meerloo—p. 5797
- Choriocarcinoma. Remarkable Case. F. Roest—p. 5800

Diameter of Erythrocytes in Hepatic Disorders—Comparative examinations with different instruments for the measurement of erythrocytes by means of diffraction rings revealed to Schalm that not all are equally reliable. The best results were obtained with the apparatus of Pijper. When this instrument is used, the estimation is made according to the yellow band in the spectrum. When the measurement was made with the red spectral band (Bock's apparatus), although it was

generally possible to state the presence or absence of enlargement of the erythrocytes, the quantitative estimation of the enlargement could not be relied on. In the studies reported here, the degree of enlargement of the mean diameter was a point of interest and so it was necessary to make the estimations with respect to the yellow band, that is, Pijper's apparatus was used. This instrument reveals 7.8 microns as the normal mean diameter. In cases of serious damage of the liver with jaundice, a distinct macrocytosis was generally found. The diameters measured between 8.8 and 9.5 microns. However, in cases of obstructive jaundice the mean diameter was not greater than 8.5 microns. In cases in which gallstones were the cause of obstruction, this figure was never surpassed. The author suggests that if these observations could be corroborated by investigations on a larger material they might prove to be of differential diagnostic value.

Benzedrine Sulfate as Brain Stimulant—Meerloo points out that since Prinzmetal and Bloomberg in 1935 recommended the use of benzedrine sulfate for the treatment of narcolepsy the substance has been used widely not only in narcolepsy but also in asthma, in parkinsonism, mental depression and so on. It is the author's object to direct attention to the dangers involved in the use of the substance. He says that benzedrine is widely used among students, and he reports the histories of four students who used it while they were preparing for an examination. The first patient complained that he felt as if he was suddenly "going crazy." Although ordinarily rather calm, he became hyperexcitable, threatened his friends and was unable to sleep at night. The author concludes that benzedrine sulfate may be an effective stimulus in some narcoleptic conditions but that the prolonged use can be harmful, in that it involves the risk of secondary toxic effects. Students should be warned against the use of this stimulant.

Acta Medica Scandinavica, Stockholm

93 375 498 (Nov. 18) 1937

- Coli Antagonism and Coli Therapy. L. H. Peretz—p. 375
- Number of Erythrocytes and Content of Hemoglobin in Blood of Newly Born Children. B. Andersen and G. Ortmann—p. 410
- Changes in Sedimentation Rate of Erythrocytes in Stored Citrated Blood as an Aid to Diagnosis in Cases of Malignant Tumors and Lymphogranuloma. L. Koster—p. 420
- Some Points of View on Cultivation of Enterococci from Feces. C. O. Oldfelt—p. 429
- Gastrographic Studies Under Administration of Food Through Duodenal Tube. Mildrid Andersen—p. 437
- *Treatment of Pellagra with Stomach Preparations and Gastrogenic Etiology of Disorder and Its Relation with Polyneuritis. S. Petri, O. Wanscher, Else Stubbe Teglbjærg and H. P. Stubbe Teglbjærg—p. 450
- Anterior Pituitary and Its Diabetogenic and Pancreatotropic (Blood Sugar Decreasing) Activity. A. W. Elmer, B. Giedosz and M. Scheps—p. 487

Stomach Preparations in Treatment of Pellagra—According to Petri and his associates, factors have been detected which indicate that pellagra cannot be completely explained on the basis of a vitamin B avitaminosis. They present evidence that disturbances in the gastric function are of decisive etiologic significance in pellagra. Further, they cite cases of manic-depressive psychoses in which pellagra developed in spite of adequate nutrition but in which treatment with stomach preparation counteracted the pellagra. These therapeutic observations, together with earlier investigations on gastrectomized dogs and hogs, indicate that changes in the function of the stomach are of decisive significance in the pathogenesis of pellagra. After discussing the mode of action of the stomach preparations in the treatment of pellagra the authors point out that besides pellagra and pernicious anemia there are still other disorders that respond to the treatment with stomach preparations. They found stomach extracts helpful in polyneuritis caused by alcoholism and accompanied by gastric disturbances. They also cite other cases of polyneuritis with impaired gastric function that responded to treatment with stomach preparations. They suggest that, in view of the therapeutic efficacy of stomach preparations in pernicious anemia, pellagra and polyneuritis, these diseases may be of uniform etiology, that is, that they represent a gastrogenic neuro-cutaneous syndrome.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 110, No 6

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CHICAGO, ILLINOIS

FEBRUARY 5, 1938

THE ABSORPTION OF DRUGS AND POISONS THROUGH THE SKIN AND MUCOUS MEMBRANES

DAVID I MACHT, M D
BALTIMORE

The importance of absorption of drugs and poisons through the skin and mucous membranes needs no emphasis. This subject is of vital interest not only to medical men but to all biologists concerned with that borderline science known as pharmacology, which has to do with the relationship of the physicochemical sciences, on the one hand, and the biologic, on the other. It is also of great practical significance, particularly to dermatologists and other medical specialists who prescribe drugs and chemicals for application to skin or mucous membranes.

I have taken a lively interest in experimental investigations on absorption of drugs and poisons for more than twenty years. Indeed, in 1910 I recorded a research on lavage in the treatment of acute phenol poisoning in which the absorption of phenol through both the skin and the mucosa of the stomach and the intestines was experimentally studied. This research led to some practical conclusions in regard to treatment.¹ Soon afterward, in a series of publications dealing with absorption of drugs through unusual channels, I demonstrated by experimental methods, physical and chemical, much to the consternation of the practical clinician, that many medicinal substances were often absorbed through previously unsuspected regions of skin and mucous membrane. Thus I² reported in THE JOURNAL a novel demonstration by which it was proved that morphine and apomorphine, absorbed through the eye without passing down the nasal ducts, produced typical emetic effects. Later I³ demonstrated that the same alkaloids are readily absorbed also through all kinds of mucous membranes, e g, those of the nose, urethra and vagina, bladder and ureter, and even through the skin of the prepuce. Further experiments⁴ showed that all sorts of chemicals such as salts, alkaloids and antiseptics, are readily

absorbed through the genito-urinary tract and particularly through the vagina.⁴ Observations of such general interest justified the publication of editorials on the subject in THE JOURNAL.⁵ Ten years later an additional report⁶ exposed the fallacy of claims made for the innocuousness of various contraceptives and proved that they are readily absorbed through the vaginal walls and produce systemic reactions. Still other studies⁷ demonstrated that drugs and poisons can be absorbed through the mucosa of the esophagus, through sockets of teeth and through the intact ear drum, a phase of the subject of interest in connection with Shakespeare's "Hamlet." A remarkable exception to the general rule was noted in connection with the urinary bladder. While the urethra is freely permeable to all kinds of drugs, the mucous membranes of the bladder are impenetrable by nearly all the chemicals studied.

In the present paper are reported the results of five years' studies on absorption of drugs through normal skin and mucosa, on the one hand, and pathologic tissues, on the other. A discussion of the clinical data accumulated will be published elsewhere, but even a mere exposition of the research will suggest new therapeutic possibilities to the alert practitioner.

ABSORPTION OF CHEMICALS APPLIED IN THEIR NATURAL STATE OR IN AQUEOUS SOLUTION

It is common knowledge that a number of drugs or chemicals, when applied to the conjunctiva and other mucous membranes and even to the integument or epidermis, are absorbed into the system and produce toxicologic reactions. Handbooks on toxicology and legal medicine furnish abundant evidence of such poisoning. Thus, for instance, many a case of poisoning by arsenic or other chemicals incorporated in cosmetics has resulted from application to the scalp. Arsenic under certain conditions can be absorbed through other regions of the skin. A striking case of fatal poisoning caused by the absorption of arsenic solution spilled over the feet of a stevedore who broke a glass carboy containing it has been described.⁸ All physicians know that the blue ointment (mercuric mercury in finely dispersed form in fat) employed as an antisyphilitic agent is readily absorbed through the skin. Signs of partial or superficial penetration of the skin have been noted after prolonged local application of cyanides and of the very poisonous alkaloid aconitine.

Read before the Section on Dermatology and Syphilology at the Eighty-Eighth Annual Session of the American Medical Association Atlantic City, N J, June 9, 1937.

1. Macht, D I. An Experimental Study of Lavage in Acute Carbolic Acid Poisoning. *Bull Johns Hopkins Hosp* 26: 98, 1915.
2. Macht, D I. The Absorption of Apomorphine and Morphine Through the Conjunctiva. *J A M A* 68: 1230 (April 28), 1917.
3. Macht, D I. On the Absorption of Apomorphine and Morphine through Unusual Channels. *Proc Soc Exper Biol & Med* 15: 26, 1917.
4. Macht, D I. On the Absorption of Drugs and Poisons from the Bladder and the Urethra. I. Absorption of Apomorphine and Morphine. *J Urol* 2: 43 (Feb.), 1918. II. Absorption of Various Alkaloids. *Antiseptics Local Anesthetics and Salts*. *ibid* 2: 211 (June), 1918. Concerning the Absorption of Drugs and Poisons from the Ureter and Pelvis of the Kidney. *ibid* 2: 481 (Dec.), 1918. On the Absorption of Drugs and Poisons through the Vagina. *J Pharmacol & Exper Therap* 10: 509 (Jan.), 1918.

5. Absorption through Unusual Surfaces. *Current Comment* J A M A 70: 1232 (April 27), 1918. The Absorption of Drugs through Unusual Channels. *editorial* *ibid* 81: 1954 (Dec 8), 1923.
6. Macht, D I. Concerning the Absorption of Quinin and Oxyquinolin Sulphate through the Vagina. *J Pharmacol & Exper Therap* 34: 137 (Oct.), 1928.
7. Macht, D I. Absorption of Drugs through the Eye, Ear, Teeth and Esophagus. *J Pharmacol & Exper Therap* 22: 123 (Sept.), 1923. A Pharmacological Appreciation of Shakespeare's Hamlet. On Instillation of Poisons into the Ear. *Bull Johns Hopkins Hosp* 29: 165 (July), 1918.
8. Macht, D I. Arsensäure Vergiftung gewerbliche durch die Haut. *Samml v Vergiftungsfällen* 1: 103, 1930.

Lead poisoning is too well known to be discussed here, and gangrene resulting from phenol dressings is still vividly depicted in certain textbooks on therapeutics. Even the opium alkaloids penetrate the epidermis deeply enough to affect the superficial sensory nerve endings, as Macht, Johnson and Bollinger⁹ demonstrated in 1919. R. V. Rice and I, in studies on the comparative pharmacology of tribromethanol and certain homologues, recently found that these compounds are readily absorbed through the skin of mice.¹⁰ In most cases, however, drugs applied directly in either natural state or aqueous solution to the skin are not absorbed into the circulating blood. Dermatologists and other practitioners accordingly have employed most frequently medicaments incorporated either in lotions or in ointments to facilitate their penetration of deeper layers of the integument. With this in mind, I began an experimental inquiry into the relative efficacy of various ointment bases employed in this manner.

PENETRATION OF FIXED OILS AND FATS

In 1932-1933 I made a series of studies on the relative penetration by different fats and oils of the skin of various animals, particularly rabbits and guinea

TABLE 1—*Toxicity of 1 Cc Doses of Essential Oils When Applied to the Skin of White Mice*

Oil	Initial Effect of Absorption	Final Effect of Absorption
Cinnamon	Unconscious in 10 min	Died in 1 hr 25 min
Cloves	Unconscious in 20 min	Died in 2 hr 20 min
Wintergreen	Unconscious in 1 hr	Recovered
Wintergreen 2 cc	Unconscious in 1 hr	Died in 1 hr 15 min
Fennel	Unconscious in 1½ hr	Died in 6 hr 30 min
Betula	Unconscious in 1½ hr	Died in 2 hr
Lemon	Unconscious in 1 hr	Died in 4½ hr
Orange	Unconscious in 30 min	Died in 5½ hr
Anise	Unconscious in 24 min	Died in 2½ hr
Peppermint	Unconscious in 12 min	Died in 1 hr
Thyme	Unconscious in 22 min	Died in 1 hr
Sassafras	Unconscious in 33 min	Died in 1½ hr
Rose geranium	Unconscious in 22 min	Died in 1½ hr

pigs. Several active drugs, the absorption of which I attempted to follow by either pharmacologic or biochemical reactions, were incorporated in ointment bases. Osmic acid, employed in purely histologic or anatomic methods, proved to be unsuitable for detecting penetrability of fats through the integument, since it is practically impossible to cut sections without dragging or pushing some of the fat into the deeper layers. Accordingly ointments were made of petrolatum, lard, hydrous wool fat, a synthetic proprietary preparation of cholesterol, goose fat, bear fat and greaseless cream, and lotions were prepared with olive oil, cottonseed oil, lard oil, mineral oil (liquid petrolatum) and peach kernel oil. The penetration of several potent drugs incorporated in these bases or vehicles was studied pharmacologically.

Thus ointments made with various bases—1 per cent iodine, 5 per cent phenol, 0.1 per cent strychnine, 1 per cent mercury bichloride, thallium salts, and a complicated synthetic organic sulfur compound, 5 per cent tetramethylthiuram monosulfide—were applied to the shaven skin of rabbits and guinea pigs. The treated areas were then covered with oil paper, bandage and adhesive tape to ensure long-lasting contact of the ointment with the skin, on the one hand, and to preclude its ingestion by licking, on the other. Fresh applications were made at various intervals thereafter, and the

animals were watched for pharmacologic or biochemical signs of absorption of the active drugs.

Absorption through the skin of iodine incorporated in an ointment was proved by its excretion in the urine. Apparently, however, the ointment form of the drug penetrated the skin no better than the liquid, indeed, it seemed in some cases that iodine incorporated in ointment bases penetrated more slowly than the official tincture painted on the intact skin. A special technique is employed to detect excretion of iodine in the urine. Even inorganic iodine (e. g., tincture of iodine) when absorbed into the body is excreted not in ionic or inorganic form but in combination with organic compounds which must be disrupted by oxidizing agents to set the iodine free before the ordinary tests, such as that with starch, can be effected.

Absorption of mercury bichloride in ointment form was determined by testing the urine for mercury and noting resultant nephritis and death of the animal. Absorption of strychnine incorporated in ointments was demonstrated by heightened excitability of the spinal cord, followed by convulsions and death.

Such experimentation revealed that none of the fixed fats carrying potent drugs were absorbed very readily, and signs of poisoning supervened in some cases only after repeated application of the ointments for several days. Hydrous wool fat was more efficient than the other fats, but on the whole the results obtained in studies with drugs incorporated in fats as well as in olive oil, linseed oil and liquid petrolatum were disappointing. All the fixed oils and fats penetrated the normal epidermis to but a slight extent, in fact, some drugs incorporated therein were absorbed less readily than when applied in aqueous or hydroalcoholic solution.

These observations do not intimate that fixed fats and oils are useless in dermatologic therapy. Their chief value in therapeutics, however, lies in their emollient and protective action and their function as fixatives which ensure long-lasting contact of other chemicals incorporated in them with the surface to which they are applied.

ABSORPTION OF ESSENTIAL OILS

After these experiments with fixed or heavy oils and fats had been completed, a new approach to the problem of selecting vehicles for conveyance of various drugs through the skin was suggested by certain medico-historical considerations. It is well known that the ancients effectively treated wounds with balsams and resins and preserved mummies by embalming the bodies with similar aromatic solutions. In both instances, extensive use was made of vegetable materials obviously efficient as antiseptics and preservatives by reason of their penetration of the superficial layers of body tissue and their permeation of those which lie deeper. The chief constituents of such balsams and resins are the so-called essential or volatile oils. It was therefore deemed worth while to inquire into the penetrative power of a series of essential, volatile or aromatic oils. The pharmacology of these oils, still widely employed as perfuming and flavoring agents (with the exception of methyl salicylate, or oil of wintergreen,¹⁰ and possibly oil of cloves), is practically unexplored. I have examined the following volatile oils: anise, bergamot, betula, caraway, cardamom, cassia, clove,

⁹ Macht, D. I., Johnson, S. L. and Bollinger, H. J. On the Peripheral Action of the Opium Alkaloids. Effect on the Sensory Nerve Terminals. *J. Pharmacol. & Exper. Therap.* 5: 51 (Aug.) 1916.
¹⁰ Rice, R. V. and Macht, D. I. *Nature* London 140: 849 1937.

¹⁰ Brown, E. W. and Scott, W. O. Absorption of Methyl Salicylate by Human Skin. *J. Pharmacol. & Exper. Therap.* 70: 32 (Jan.) 1932.
Comparative Absorption of Certain Salicylate Esters by Human Skin. *ibid.* 50: 373 (April) 1934.

mile, cinnamon, citronella, cloves, coriander, eucalyptus, fennel, jasmine, juniper, kananga, lavender, lemon, marjoram, neroli, nutmeg, orange, pennyroyal, peppermint, rose geranium, rue, sassafras, spearmint, tansy, thyme, wintergreen

I applied small quantities of various volatile oils directly either to the fur of mice, rats and guinea pigs or to the shaven skin of rats, guinea pigs, rabbits, cats and dogs, and unmistakable signs of absorption of all the essential oils were thus obtained. The smaller animals are especially useful for demonstrating this phenomenon. Some of the volatile oils effected a primary excitation followed by depression, coma and death, others produced immediate depression and still others convulsions. In all cases a sufficiently large dose (1 cc or more) applied to mice or rats was fatal. These toxic symptoms were due neither to ingestion nor to inhalation of the oils, as control experiments definitely indicated. Table 1 shows the effect of application to mice of 1 cc of respective essential oils. Smaller quantities of these oils produced definite pharmacologic reactions but not death.

These observations are of great interest from both the pharmacologic and the therapeutic points of view because they beautifully corroborate the experiences of the ancients, who employed preservative oils, spices and balsams for embalming, and because these oils have recently been proved to possess antiseptic properties.¹¹

The clinical practitioner should not conclude, however, that such oils may be employed medicinally without further inquiry as to their dangers. Nearly all of them when given in sufficient quantity are grave poisons effecting fatty and parenchymatous degeneration of the kidneys and injuring the central nervous system. Thus, during the World War an attempt was made to employ some of these oils and their derivatives as defousing agents. They killed the hosts as well as the parasites. Too much emphasis cannot be laid on the profound dictum of modern pharmacology that every drug is a poison and that every poison may be a drug. No chemical should be used medicinally until extensive pharmacologic study has determined its margin of safety or so-called therapeutic index.

ESSENTIAL OILS AS VEHICLES

Having demonstrated that most of the essential oils, applied in sufficient quantity, are readily absorbed through the skin, I employed some of them as vehicles or solvents for other active drugs. Thus strychnine, dissolved in a little alcohol and mixed with one or other of the essential oils and applied to the skin of mice and rats, was carried into the deeper tissues and produced typical strychnine poisoning. The fixed oils had no such effect, as the following protocol reveals.

EXPERIMENT 1—Strychnine, in a 1:1,000 solution, was incorporated in 0.5 cc. of various vehicles and applied to white rats. Cottonseed oil and strychnine, castor oil and strychnine and olive oil and strychnine had no effect. Oil of orange and strychnine and oil of wintergreen and strychnine each produced convulsions and death in ten minutes.

CONSTITUENTS OF ESSENTIAL OILS

Having demonstrated that most of the essential oils penetrate the skin and may be employed to convey other potent principles dissolved in them into the deeper tissues, I proceeded to inquire into the pharmacology of various chemical constituents of these compounds.

Numerous pure chemical constituents have already been isolated from many of the essential oils, although many of them are of complex composition. These constituents are heterogeneous and include a large variety of terpenes, aromatic alcohols and their esters, a number of higher aliphatic alcohols, aldehydes, ketones, phenols and phenolic esters and esters of aromatic acids, and a number of sulfur compounds. The following is a list of some such compounds which I selected for study: phenethyl alcohol, benzyl alcohol, phenol, cymol, thymol, guaiacol, geraniol, menthol, linalool, eucalyptol, anethole, eugenol, safrol, isosafrol, amyl alcohol, hexyl alcohol, heptyl alcohol, octyl alcohol, nonyl alcohol, decyl alcohol, fenchyl alcohol, borneol (camphyl alcohol), citronellol, nerolin, terpineol, asarol, benzyl benzoate, benzyl acetate, vanillin, coumarin, benzaldehyde, cinnamic aldehyde, citral, heliotropin, camphor, fenchone, menthone, carvene, pulegone, thu-

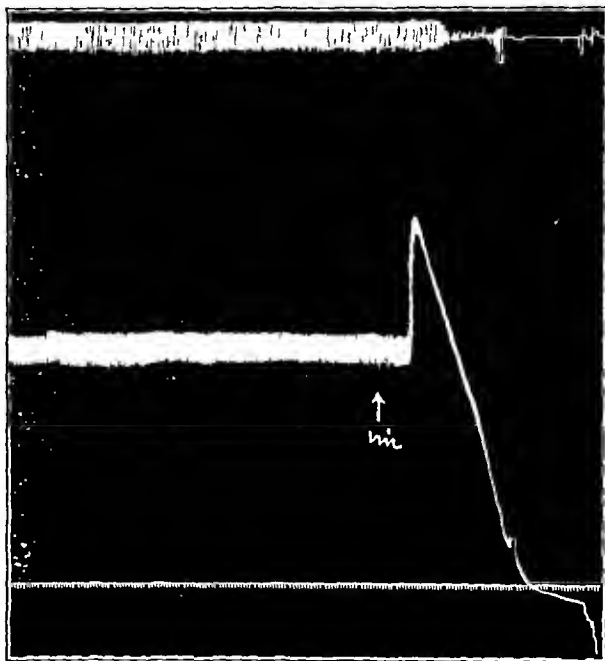


Fig 1—Effect of one drop of nicotine on the normal pharynx of a cat under ether anesthesia

jone, methyl salicylate, turpentine, pinene, dipentene, phellandrene, limonene, salicylaldehyde and sulfur compounds.

The absorption of small quantities of these dissolved in alcohol, combined with other members of the series and applied to the integument of various animals was carefully investigated. Small animals (mice and rats) proved especially useful in such studies. More promising compounds were later studied for their penetration through the skin of larger animals. Absorption was generally detected by physiologic and pharmacologic reactions of the animals and in some cases by chemical tests of the urine or blood. Some of the compounds, like the essential oils themselves, produced primary excitement followed by depression, others were depressant from the outset and still others were violent convulsants. The effect of fenchyl alcohol diluted with ethyl alcohol may be cited as typical of the pharmacologic response usually obtained.

EXPERIMENT 2—Three cc. of 90 per cent ethyl alcohol applied to the back and abdomen of rat 1, weighing 160 Gm., caused some irritation but no other sign of poisoning.

¹¹ Malouan S. L. Ueber die keimtötende Wirkung der ätherischen Öle. Zt. chr. f. Hyg. u. Infektionskr. 112: 93, 1931. Miller R. E. Bactericidal Efficiency of Essential Oils. Am. J. Pharm. 103: 324 (June) 1931.

Three cc of fenchyl alcohol applied to the back and abdomen of rat 2, weighing 170 Gm at 10 16 a m caused some depression at 10 25, marked depression and dyspnea at 11 07, marked prostration at 11 35 and coma and shallow breathing at 12 55 p m At 4 p m the animal was half awake, and the next day it recovered

Some of the other aromatic compounds were even more potent, such as safrol and isosafrol, minute quantities of which produced convulsions and death after application to all kinds of animals

More detailed description of various observations is published elsewhere^{11a}

SOME AROMATIC COMPOUNDS AS VEHICLES

Having already employed the essential oils themselves as vehicles for minute doses of other potent drugs, I proceeded to make similar use of their constituents Active drugs, such as alkaloids, glucosides and antiseptics, were dissolved in various aromatic constituents of essential oils, usually with ethyl alcohol, and the solutions were

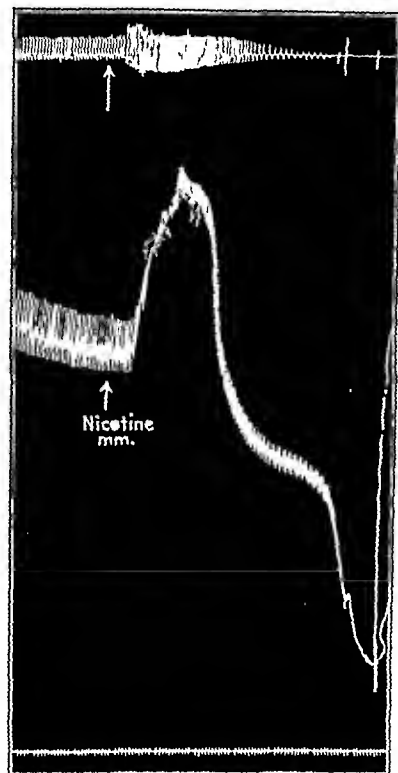


Fig 2—Effect of nicotine on the pharynx previously painted with ephedrine hydrochloride of a cat under ether anesthesia

applied to the skin An experiment with strychnine will serve as an illustration

EXPERIMENT 3—When applied to the back of mouse 1, 0.4 cc of a mixture of eugenol and alcohol (1:1) caused coma in one hour The animal recovered the next day Two tenths cc of the same mixture containing 1 mg of strychnine was applied to the back of mouse 2 at 2 22 p m At 2 34 p m 0.2 cc more was applied At 2 45 p m hyperexcitability was present Convulsions and death occurred in two hours

Table 2 shows the drugs thus studied and the methods of their detection

ABSORPTION THROUGH NORMAL VERSUS PATHOLOGIC SKIN AND MUCOUS MEMBRANES

Nicotine is one of the most potent poisons known to man, being second in point of lethal dose to but one other alkaloid—aconitine This poison, though employed extensively by men and women as a sort of narcotic stimulant and sedative in the form of tobacco, has no place in rational pharmacotherapy For the research physiologist and pharmacologist, however, the alkaloid is a valuable test agent because of its selective action for the autonomic ganglions and because of its ready penetration of skin and mucous membranes A drop of nicotine is readily absorbed when applied to shaven skin of anesthetized rats, guinea pigs and rabbits When applied to the shaven abdomen of rats anes-

thetized with urethane,¹² the alkaloid first stimulates and then gradually paralyzes the respiration and finally produces death A drop of nicotine alkaloid, placed on any mucous membrane of an animal, such as the tongue, pharynx or conjunctiva, is rapidly absorbed and produces the characteristic picture of nicotine poisoning, i e, primary stimulation of the medullary centers and the heart ganglions, followed immediately by their paralysis and by death in a few minutes

I have used this toxicologic property of nicotine to advantage in studying the rate of absorption through normal and abnormal mucous membranes of deeply anesthetized laboratory animals A small drop of the alkaloid (0.05 cc) placed on the pharynx of a cat rabbit or dog under ether anesthesia rapidly penetrates the mucous membrane and produces death in a few minutes After the mucous membrane of the pharynx was scalded, frozen or treated with phenol, silver nitrate, mercury bichloride, epinephrine, ephedrine, mercurochrome, tincture of iodine or gentian violet, such experiments with nicotine were repeated It was found that absorption of nicotine was markedly retarded after previous treatment of the mucous membrane with some reagents, whereas after application of others the alkaloid penetrated as readily as it did in case of normal animals Thus after the pharynx was painted with epinephrine, ephedrine or mercurochrome, absorption of nicotine was not delayed, whereas after the pharynx had been treated first with glycerite of tannin, silver nitrate or phenol, penetration of the alkaloid was markedly retarded Absorption of nicotine through mucosa previously partially destroyed or injured (with the animal under anesthesia) by freezing or scalding was also greatly retarded The alkaloid rapidly penetrated mucosa to which weak solutions of cocaine had been applied, but not those treated with cocaine "mud," which produced superficial necrosis of the cells

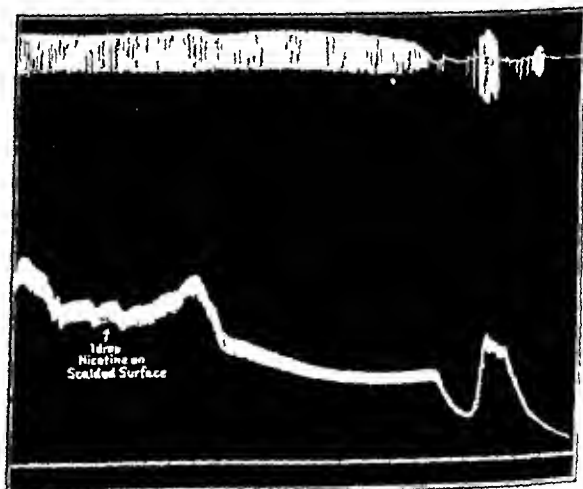


Fig 3—Absorption of nicotine through the injured mucosa of the previously scalded pharynx of a cat under ether anesthesia

In general it may be stated that such reagents as did not produce destruction of superficial cells interfered but little with absorption of nicotine, whereas more powerful reagents producing more or less necrosis of the surface cells retarded penetration of the alkaloid The same was found to be true with regard to

¹² Macht D I and Hill P S Jr Urethane—Rat I. A Study of Intestinal Peristalsis. *Proc Soc Exper Biol & Med* 20: 1 (June) 1929

absorption of nicotine through normal and pathologic skin of rats, rabbits and cats. Here again nicotine penetrated more rapidly through normal healthy skin than through skin previously injured by corrosive or destructive chemicals or physical reagents such as heat and cold.

These observations regarding the penetration of nicotine through the skin are in complete accord with those of Macht, Anderson and Bell¹³ concerning the penetration of ultraviolet rays through living skin as compared with dead or partially necrosed tissue. The accompanying tracings illustrate some of the data obtained in these experiments, data of obvious clinical importance as they throw light on the rationale of some hitherto unexplained therapeutic procedures. These experiments indicate not only that tannic acid is an

TABLE 2—Penetration into the Animal Body of Active Drugs Incorporated in Aromatic Vehicles

Active Drug Absorbed	Test Object	Signs of Penetration and Absorption
Morphine	Mouse	Straub phenomenon*
Apomorphine	Mouse	Straub phenomenon
Apomorphine	Dog	Nausea and retching
Apocodine	Mouse	Straub phenomenon and purgation
Strychnine	Mouse	Excitement and convulsions
Strychnine	Rat	Excitement and convulsions
Strychnine	Guinea pigs	Excitement and convulsions
Acetate hydrochloride	Guinea pigs	Bronchoconstriction and asthma slowing of heart delirium cordis and death
Quinine sulfate	Guinea pig	Phytotoxic reaction of blood
Cocaine alkaloid	Guinea pig	Phytotoxic reaction of blood
Pilocarpine hydrochloride	Rabbit	Salivation myosis slow heart beat purgation
Physostigmine salicylate	Rabbit	Myosis slow heart beat purgation
Atropine sulfate	Rabbit	Mydriasis
Atropine sulfate	Cat	Mydriasis
Curare	Mouse	Paralysis of the respiratory muscles
Thallium acetate	Guinea pig	Lethal effect
Insulin	Rats	Convulsions blood sugar de terminations
Heparin	Guinea pigs	Coagulation time

* Straub W. Eine empfindliche biologische Reaktion auf Morphin. *Deutsche med. Wochenschr.* 37: 1402, 1911. Macht D. I. A Pharmacodynamic Analysis of Straub's Morphine Reaction. *Proc. Soc. Exper. Biol. & Med.* 17: 100, 1920.

† Macht D. I. and Livingston M. B. Effect of Cocaine on the Growth of *Lupinus Albus*. A Contribution to the Comparative Pharmacology of Animal and Plant Protoplasm. *J. Gen. Physiol.* 4: 573 (May) 1922.

‡ Investigations in progress

astringent but that it tends to retard absorption of toxic matter from the mucous membrane. Similarly, they furnished further proof of the rationality of the modern treatment of burns by application of tannic acid and silver nitrate solutions to burned areas of human tissue.

COMMENT

A number of research projects concerning absorption of drugs, poisons and chemicals through skin and mucous membranes yielded interesting and helpful information. It was found that fixed oils and fats at best are but poor vehicles for carrying other drugs into the deeper layers of the integument. On the other hand, it was discovered that the so-called essential, aromatic or volatile oils, a large group of drugs hitherto employed mostly as flavoring and perfuming agents and tanninatives (with the exception of oil of wintergreen) rapidly penetrated intact skin and produced profound physiologic and pathologic effects often ending in death. Some of these volatile oils were employed as vehicles for more powerful drugs, such as various alkaloids and promoted their absorption through the intact skin.

Studies of a series of pure chemical constituents of the volatile or essential oils revealed that most of them are also easily absorbed through not only the mucous membrane but also the integument. Many of these chemicals are quite poisonous, but when diluted with alcohol and other solvents they may be utilized as vehicles for carrying other active drugs into deeper layers of the skin and into the systemic circulation. Thus it has been demonstrated experimentally that the penetration of the skin of mice and rats by morphine, strychnine, atropine, pilocarpine and other drugs can be facilitated by incorporating them in such vehicles.

This discovery, obviously of considerable importance from the standpoint of applied therapeutics, offers a rational basis for various time-honored therapeutic procedures employed by the best of the older physicians. It was shown, for instance, that the use of phenol in glycerin for infection of the middle ear has a rational basis. It has also been demonstrated by these experiments that the efficacy of turpentine stupes applied to the abdomen for the relief of gas pains is actually due to the absorption of the terpenes through the skin. Even the use of opium lotions for injuries to the eye has a rational pharmacologic basis. Again, studies on pathologic mucous membranes and skin were found to speak for the efficacy of astringents in the treatment of diseases of the throat and experimentally support the modern treatment of burns with tannic acid and silver nitrate.

In the present paper I have purposely refrained from citing clinical data obtained in connection with my studies on volatile oils and their constituents. Such clinical data are already in hand, but the subject is still under investigation. No great stretch of imagination is required to grasp the therapeutic possibilities suggested by the discovery of a large series of chemical compounds which may be employed as vehicles for active drug principles, fungicides and other useful therapeutic agents.

SUMMARY AND CONCLUSIONS

1 Experiments with ointments and lotions prepared with fixed fats and oils—petrolatum, hydrous wool fat, lard, olive oil and linseed and cottonseed oils—indicate that none of these are very efficient in promoting absorption of drugs incorporated in them through normal skin. Hydrous wool fat was a more effective vehicle than other members of this series.

2 A large group of essential or volatile oils, official and nonofficial, on the other hand, was readily absorbed through the intact skin of various animals, as indicated by physiologic and biochemical reactions occurring after their application.

3 Many pure chemical constituents obtained from volatile oils or synthetically prepared were found to be absorbed rapidly through the normal skin.

4 A number of the volatile oils as well as some of their constituents were successfully used as vehicles to introduce into the body various potent alkaloids and other drugs.

5 Toxicologic experiments with nicotine revealed that it is rapidly absorbed through both mucous membranes and intact skin. Advantage was taken of this toxicologic property of the drug in investigating its penetration through diseased and pathologic tissues of animals under deep anesthesia as compared with normal surfaces of the body. Such studies revealed differences between normal and injured skin and mucous membrane.

¹³ Macht D. I., Anderson W. T. Jr. and Bell F. K. The Penetration of Ultraviolet Rays into Live Animal Tissues. *J. A. M. A.* 90: 161 (Jan. 21) 1923.

ABSTRACT OF DISCUSSION

DR ISAAC R. PELS, Baltimore This contribution by Dr Macht is noteworthy from the standpoint that it illustrates the evaluation of various drugs that penetrate the skin through a method that has not been universally used. The fact that he stressed the penetration of animal fats is of course, important. We all know that, but I wish he had said something, and he probably does in his paper, regarding the use of vanishing creams and their pharmacologic action. A discussion of the scientific details of this paper obviously lies within the province of the properly qualified expert. Therefore I shall limit my discussion to generalities and to a brief comment on its practical importance. The skin has always been an acceptable and fruitful field for functional and therapeutic studies and naturally will continue to be so. It is indeed an amazing experience to take account of the numerous investigations of medicaments, poisons and chemical agents in their effects on the skin and on the body. Some twenty-five years ago Unna, in his studies of chemistry of the skin, concluded that certain few solid and liquid substances (caustic acids and alkalis, phenols) as well as all gaseous and vaporous bodies, can penetrate the skin and, contrariwise, all soluble, indifferent substances, such as neutral salts, cannot. Dr Macht has at least given us a serious incentive to improve this situation by suggesting additional methods of experimental study in the use of drugs and vehicles, volatile oils and their components. Whatever effects these studies may reveal on the cells, circulation, nerves and adnexa of the dermis from the physical, functional, chemical and pathologic standpoints must be deferred to future studies. The interpretation by pharmacologic methods, however, of changes and effects would seem to be more conclusive than the interpretation of purely biologic changes. Furthermore, in recording the results of penetration of the skin and mucous membranes the important factor of the limits of safety in the application of these experimental substances has been indicated or suggested by the author. Every practitioner realizes the indications for and the value of symptomatic, palliative and expectant therapy, particularly when the etiology remains obscure. Stimulating, inhibitory and destructive procedures, in other words radical therapy which aims to "change the soil" of pathologic conditions of the skin, appears to be the field for investigation to which Macht has drawn our attention.

DR THEODORE CORNBLEET, Chicago I was interested to hear that Dr Macht found that the essential oils, ketones and their related substances do not penetrate as well through the pathologic skin as through the normal skin. I have tackled this problem in a somewhat different way, through a study of the ketone excretion in the urine. In this study I found that the amount of ketones in the urine increased proportionately to the size of the area of skin involved in any kind of a dermatitis. Now it appears that these ketones, which occur ordinarily on the skin surface in the sweat, penetrate the skin with difficulty when there is a dermatitis present and as a result are excreted instead through the urine. Inflamed skin acts, therefore, as a barrier to both materials at the surface and in the lymph and blood. My feeling is that this problem is related to a type of equilibrium between constituents of the blood and the secretions at the surface of the skin. For instance, there is some evidence at the present time that cholesterol and like products are excreted to the surface of the skin and then reabsorbed. In this way perhaps many substances are excreted and finally reabsorbed after modification. This process is interfered with at an inflamed site.

DR. DAVID I. MACHT, Baltimore Dr Pels mentioned greaseless creams. These are the worst vehicles of all and it is not surprising, as these are really soaps, soap suds with an addition of a little oil to make them stick and look nicer. I want to stress particularly a few words regarding the difference between normal and pathologic skin in relation to absorption, because I did not speak enough on the subject when I read my paper. It seems, as a result of all my experiments, that living tissues are more easily penetrated by chemicals than dead tissues, with one exception. If a burn is produced by an actual cautery with a raw wound and open vessels, there occurs, of course marked absorption, but if a burn is produced by scalding there is coagulation of proteins and the absorption is practically nil.

These facts with regard to the difference between normal and pathologic skin and mucous membranes in respect to penetration of drugs are parallel to the results of experiments reported by Dr Anderson, Dr Bell and me some years ago with regard to the penetration of ultraviolet rays through skin and mucous membranes, which most dermatologists are also interested in. We have shown that penetration of these rays, even of short ultraviolet rays, is much greater through living tissue than was supposed. The trouble was that previous experimenters made their experiments either on leather or on dead skin, and there, of course, that had altogether different conditions and results. I was interested in the statement made by Dr Cornbleet regarding the ketones in relation to normal and pathologic skin surfaces, because that fits in very well with my observations.

EFFECTS OF VITAMIN B (B₁) THERAPY ON THE POLYNEURITIS OF ALCOHOL ADDICTS

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Prior to the recognition of the role played by vitamins, polyneuritis in the alcohol addict was usually attributed to the direct toxic action of alcohol. Shottuck,¹ Minot² and Wechsler³ suggested that vitaminosis probably played an important role in the production of this type of polyneuritis. Several investigators then specifically indicted vitamin B. This opinion was based primarily on the following observations: first, that patients with "alcoholic" polyneuritis had as a rule an inadequate food intake, second, that "alcoholic" polyneuritis and beriberi showed similar clinical and pathologic manifestations. In addition it was observed that these subjects improved when given diets rich in vitamin B and that when such diets were supplemented by vitamin B concentrates improvement occurred even while the subjects were given from 1 pint to a quart of whisky daily.⁴

Recent fundamental contributions have made possible a more direct approach to the study of the etiology of syndromes suspected of being on the basis of vitamin B deficiency. The first of these contributions was Cowgill's⁵ determination of the vitamin B requirement of man and of a formula by which this requirement can be predicted. Cowgill's formula has been confirmed clinically by Baker and Wright⁶ and

Owing to lack of space this article is abbreviated in THE JOURNAL by omission of the tables. The complete article appears in the authors' reprints.

Read before the Section on Pharmacology and Therapeutics at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 9, 1935.

From the departments of Medicine and Psychiatry, New York University College of Medicine and the Psychiatric Medical Service of the Third (New York University) Medical Division, Bellevue Hospital.

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Van Veen⁸ abroad and by Jolliffe, Colbert and Joffe⁹ in this country. The next contribution was the production of crystalline vitamin B₁ in amounts sufficient for clinical investigation.¹⁰

Using Cowgill's formula, Jolliffe, Colbert and Joffe⁹ in a study of reliable dietary histories of forty-two alcohol addicts showed, first that the diets of alcohol addicts with polyneuritis failed over an effective period of time to contain adequate quantities of vitamin B, second that the diets of alcohol addicts without polyneuritis, though the addiction was of long duration, contained adequate quantities of vitamin B, and, third, that certain subjects without polyneuritis consumed enough alcohol over a sufficient period of time to cause peripheral nerve involvement if alcohol per se was its cause.

Jolliffe and Colbert¹¹ then presented evidence that the rate and the degree of improvement in the objective signs of polyneuritis were roughly proportional to the vitamin B intake in twenty-eight alcohol addicts with uncomplicated polyneuritis who were given diets containing one time (group A), two times (group B) and four times (group C) the estimated vitamin B requirement of subjects weighing 60 Kg.

If the rate and degree of improvement of subjects treated by diets containing approximately four times their vitamin B requirement could be enhanced by a further increase in vitamin B, without otherwise changing the diet, the belief that polyneuritis in the alcohol addict is a manifestation of vitamin B deficiency would receive added support. This is our purpose in the present study.

We are cognizant of the fact that other factors than vitamin B deficiency may cause a peripheral neuritis. These may and do operate in the alcohol addict as well as in subjects not addicted to alcohol. We are also aware of the hazards of drawing conclusions as to etiology from therapeutic results. Improvement in these patients, or the degree of their saturation with vitamin B, cannot as yet be gaged by a practical laboratory procedure. Furthermore, peripheral neuritis is a chronic disease, subject to wide variations in degree of involvement, occurring in subjects who frequently have a multiple rather than a single deficiency and in whom the pathologic changes, because of extent or duration, may be so far advanced as to be irreversible. For these reasons, in a study of etiologic factors by therapeutic methods it is necessary that the subjects treated should present, at least clinically, no evidence of other deficiency diseases, and the changes in their peripheral nerves should at least appear to be reversible. We have accordingly chosen for this study patients who have a mild degree of involvement and whose polyneuritis we therefore believe, in the absence of a reliable history, to be of relatively short duration.

METHODS

The criteria we have used to designate mild polyneuritis are as follows. The signs must be limited to the lower extremities, with the knee jerks preserved and with no obvious muscle atrophy or foot drop, the patient must show absent ankle jerks plus some

demonstrable sensory change such as muscle tenderness, skin hyperesthesia in a peripheral nerve distribution, and impairment of the vibratory or position sense. As in previous studies, the tendon reflexes are reported only as being present or absent, and sensory changes are reported as to extent but not as to degree. In an earlier study¹¹ the efficacy of treatment by varying amounts of vitamin B was compared at the end of twenty-one days. The thirteen subjects who were treated with a diet containing approximately four times their predicted requirement of vitamin B had various degrees of involvement, the severity rating of the polyneuritis being as follows: mild, three cases; moderate, eight; severe, two. As a group, ten (77 per cent) showed motor improvement, and eleven (85 per cent) showed sensory improvement at the end of twenty-one days. A review of the case histories disclosed, however, that at the end of ten days only four (30 per cent) showed motor improvement, the same four patients were also the only ones showing sensory improvement. If again increasing the vitamin B intake would advance recovery, a ten day period of observation offered an obviously better comparative basis than twenty-one days. We have therefore made the comparison of changes in objective signs of polyneuritis at the end of ten days.

On admission to the medical wards, each subject having a polyneuritis was given a basal diet¹² containing a vitamin/calory ratio of 17, plus 18 Gm of autoclaved vegex. As we have previously shown, this diet, which is of borderline adequacy in vitamin B for a subject weighing 60 Kg., results in no improvement in objective signs of peripheral neuritis. The subjects were maintained with this diet for from three to five days, during which time it was determined whether the patient was cooperative and whether complications existed. Conditions likely to increase the vitamin B requirement or prevent its absorption or utilization were considered complications. The subjects having these conditions are not reported. Jaundice, ascites or signs of liver cirrhosis did not cause exclusion from this study. If the patient was suitable for further study he was then given a weighed diet containing a vitamin/calory ratio of 55, plus 18 Gm of unheated vegex, which increased the vitamin/calory ratio to 68, approximately four times the vitamin B requirement of the subject weighing 60 Kg. To alternate subjects we gave in addition 10 mg¹³ of crystalline vitamin B₁, freshly dissolved in 2 cc of physiologic solution of sodium chloride, by intravenous injection at daily intervals. This amount of crystalline vitamin B₁, calculating 1 mg as equal to 6,660 mg equivalents of Cowgill increased the vitamin/calory ratio to 283 or about sixteen times the vitamin B requirement of a subject weighing 60 Kg. Of the subjects studied, seventeen fulfilled our criteria for a mild polyneuritis, eight of these received crystalline vitamin B₁, and nine dietary treatment alone. The latter group served as a control for those treated with the crystalline preparation. We have designated the control subjects group C, since their treatment was identical with that of group C in a previous study. The subjects receiving 10 mg of crystalline vitamin B₁ daily for ten days we have designated group D. Observations were made by the same observer and checked at frequent intervals by the second observer during the ten day period.

⁸ Van Veen A. G. Het B₁ gehalte van Voedingsmiddelen. Genees k. Tijdschr. Nederl. Indie 75: 20-26 (Nov. 26) 1935.
⁹ Jolliffe Norman, Colbert C. N. and Joffe P. M. Observations on the Etiologic Relationship of Vitamin B (B₁) to Polyneuritis in the Alcohol Addict. Am. J. M. Sc. 191: 515-526 (April) 1936.
¹⁰ Williams R. R., Waterman R. E. and Keresztes J. C. Larger Yields of Crystalline Antineuritic Vitamin J. Am. Chem. Soc. 58: 1187-1191 (May) 1934.
¹¹ Williams R. R. and Cline J. K. Synthesis of Vitamin B₁. Ibid. 55: 1504-1505 (Aug.) 1933.
¹² Jolliffe Norman and Colbert C. N. The Etiology of Polyneuritis in the Alcohol Addict. J. A. M. A. 107: 642-647 (Aug.) 1936.

¹² One mg of the crystalline substance is equivalent to 333 international units.
¹³ Courtesy of Merck & Co. Inc. Rahway, N. J. We have used both Vitamin B₁ Merck Natural Crystals and their synthetic product Betabion.

RESULTS

Observations on the objective neurologic signs of peripheral nerve involvement in the nine patients in group C, and the results of maintaining them with a diet containing a vitamin/calory ratio of 68, are summarized in table 1. Observations on the eight patients in group D, maintained with the same diet as those in group C but who received in addition 10 mg daily of crystalline vitamin B₁, are summarized in table 2. The results in the two groups at the end of the ten day period are compared in table 3. Subjects in group D, by every method of comparison, showed greater improvement than the control subjects in group C. At the end of the ten day period only one (11 per cent) of the subjects in group C was considered cured but four (50 per cent) of the subjects in group D were so considered. Motor improvement was observed in two (22.2 per cent) of the subjects in group C, while five (62.5 per cent) in group D showed motor improvement. Sensory improvement occurred in four (44.5 per cent) subjects in group C, and in all of group D.

These results are remarkable, but the conditions of this study must be borne in mind. These subjects had but a mild polyneuritis and, as far as we are aware, presented no clinical evidence of another deficiency disease or other complications as previously defined. Patients manifesting evidence of a more severe polyneuritis, when treated as those in group D, occasionally exhibit dramatic improvement. Subject 7, previously presented by Jolliffe and Colbert¹¹ in table 4 of their paper, illustrates this dramatic response. This subject, following the administration of 20 mg of natural crystalline vitamin B₁, showed within forty-eight hours a return of the knee jerks, a disappearance of the foot drop and striking improvement in the sensory status. Such dramatic response in a patient with more than a mild polyneuritis has not since been observed, though we have treated more than sixty patients with various diets and varying amounts of vitamin B. Because of the wide variations in the degree and duration of involvement, and the various complications present in the subjects having more than a mild polyneuritis, we have as yet too few cases in the several groups from which to draw any conclusions. However, since our results may suggest the correct solution of certain problems in vitamin B therapy, some of these problems will be illustrated in the following cases.

CASE 46—An actress, aged 35, was brought to the hospital April 1, 1936, by her husband, who stated that she had been drinking heavily for eight or nine years and had been eating little during the past year. Six months prior to her admission, ascites developed. Three abdominal paracenteses were performed, the last a week before admission. On physical examination she showed a moderately severe polyneuritis with absent triceps, knee and ankle jerks. Vibratory sensation was absent in the ankles and below, and position sense was absent in the toes. There was calf muscle tenderness, stocking hyperesthesia extending to the mid thigh, and glove hyperesthesia extending to the elbows. In addition, she had a hydrothorax, marked ascites and dilated abdominal veins. The spleen felt firm and was palpable three fingerbreadths below the costal margin, the liver was just palpable. There was no edema of the lower extremities, nor were there any signs of congestive heart failure such as dilated veins in the neck, orthopnea or dyspnea. The heart was not enlarged on roentgen examination. The patient was given the diet and *vege* received by group C, the fluid and salt intake was not restricted, and no medication other than sedatives was given. On the ninth day a gain in weight of 3½ pounds (1.587 Gm) and increasing abdominal distention necessitated abdominal paracentesis. Twenty pounds (9 Kg) of clear, straw colored ascitic fluid was removed. By this time improvement in the neurologic signs had occurred. The triceps

jerks had returned, glove and stocking hyperesthesia had diminished, and the vibratory sensation had returned in the ankles continuing to be absent only in the toes. The same regimen was continued. By the twenty-first day a gain in weight of 10½ pounds (4.8 Kg) had occurred. Paracentesis was again performed and 8 pounds (3.6 Kg) of ascitic fluid removed. Further neurologic improvement had occurred by this time in that the knee jerks had returned and the glove hyperesthesia had completely disappeared. Beginning on the twenty-second day, 10 mg of natural crystalline vitamin B₁ was administered daily by intravenous injection for five consecutive days. By the twenty-eighth day the stocking hyperesthesia had diminished to the ankles, calf muscle tenderness was absent, and vibratory and position sense were intact, though the ankle jerks remained absent. The patient was now mentally clear. From the twenty-second day to the twenty-eighth day the patient gained 8 pounds (3.6 Kg) and there was sufficient ascites so that a fluid wave in the abdomen could be elicited. But further increase in ascites did not occur, the weight first became stationary, and on the thirty-sixth day she began to lose weight. By the forty-eighth day she had lost 11 pounds (5 Kg), and evidence of ascites had disappeared. During this period the neurologic signs remained unchanged from those of the twenty-eighth day. By the sixty-sixth day the patient had gained 4 pounds (1.8 Kg), but there was no evidence of ascites or edema. The ankle jerks remained absent but the stocking hyperesthesia had diminished so that it now involved only the plantar surface of the feet. To note the effect on the remaining signs of polyneuritis, 10 mg of natural crystalline vitamin B₁ was administered daily by intravenous injection for five days. By the seventy-second day the ankle jerks had returned and the hyperesthesia had disappeared. The patient was discharged June 15, 1936, without signs of polyneuritis or mental disease. The spleen remained palpable to the same extent as on admission, but the distended abdominal veins were now less prominent. She then was treated as an outpatient with a diet rich in vitamin B supplemented by three teaspoonfuls of *vege* daily, and to the present (eleven months later) alcoholism, ascites or polyneuritis has not returned.

The response of this patient indicates that cirrhosis of the liver may not interfere with either the absorption or the utilization of vitamin B. During the first twenty-one days, when the treatment was entirely oral, the response was about the average obtained in other patients with as severe a neuritis but without clinical evidence of cirrhosis. The addition of crystalline vitamin B₁ on two occasions approximately quadrupled the vitamin B intake, and the increased response during those two periods can be attributed to that fact.

Patients having polyneuritis may show relatively little response to vitamin B therapy as judged by the objective signs of peripheral nerve involvement, especially in the motor phase. This lack of satisfactory response, granted that the etiology is vitamin B deficiency, is most likely due to an irreversible anatomic lesion. This irreversibility may be due to either a severe deficiency over a short period or a mild or moderate deficiency over a longer period.

CASE 47—A policeman, aged 35, was admitted to the hospital Nov. 11, 1936, his third admission to this service because of alcoholism. His first admission, May 2, 1936, was occasioned by a hematemesis. At that time he showed signs of a mild polyneuritis with absent ankle jerks, absent vibratory sensation in the toes, marked tenderness of the calf muscles, and plantar hyperesthesia. The position sense in the toes was maintained, the gait was natural, and no muscle atrophy was noted. The patient received the house diet for hematemesis and was discharged May 31 with the polyneuritis unimproved. He continued to drink a quart of whisky daily, ate poorly and was readmitted June 3 at which time the polyneuritis was still considered mild. He was discharged two weeks later and promptly resumed his intemperate habits. On the present admission occasioned by inability to walk, the knee jerks were preserved, the ankle jerks were absent and vibratory sensation was absent in the pelvis and below. Position sense in the toes was intact but

marked tenderness of the calf muscles, plantar hyperesthesia and atrophy of the calf muscles were present. The tongue was completely bald. There were dilated veins over the lateral walls of the abdomen extending up to the level of the axilla and down to the midthighs. The spleen was not palpable, but the liver extended to within a fingerbreadth of the umbilicus. There was no edema, ascites, jaundice or signs of congestive heart failure. The patient was given the same treatment as subjects in group C and in ten days showed sensory improvement in that vibratory sensation was now absent only in the toes. Continuing with the same diet, and beginning on the eleventh day of study, 10 mg of synthetic crystalline vitamin B₁ was given by intravenous injection for thirty consecutive days. By the seventeenth day, i.e., following 60 mg of crystalline vitamin B₁, the tenderness of the calf muscles had disappeared. By the twenty-sixth day, after 150 mg of crystalline vitamin B₁, the plantar hyperesthesia had disappeared, but the ankle jerks had not returned and the vibratory sense remained absent in the toes. No further improvement occurred by the forty-third day, or after 300 mg of crystalline vitamin B₁. At this time the dose of synthetic crystalline vitamin B₁ was increased to 50 mg daily and continued for ten days, but there was no further improvement in the objective signs of polyneuritis. During his stay in the hospital the patient's weight increased from 132 to 155 pounds (60 to 70 Kg.), associated with a marked increase in strength. On admission it had been impossible for the patient to stand, but by the twenty-first day he could walk on a wide base, and on discharge the gait was considered normal.

The response in this subject, as measured by the objective signs of polyneuritis, was limited to improvement in the sensory status. Although objectively there was little improvement, functionally the ability to walk, probably occasioned by the marked gain in strength, is not to be ignored. The failure of the ankle jerks to return after 800 mg of synthetic crystalline vitamin B₁ had been administered during forty-three days is due, we believe, to relatively irreversible anatomic changes in the peripheral nerves occasioned by the long duration of a mild vitamin B deficiency.

CASE 48—A man, aged 35, a vagabond, admitted to the hospital Dec 3, 1936, complained of marked weakness and pains in the legs and swelling of the ankles during the preceding few days. Because of the patient's mental status, a reliable history was unobtainable. Examination showed a moderately severe polyneuritis with absent ankle and knee jerks. The vibratory sensation was absent in the pelvis and below, but position sense was intact. There was marked tenderness of the calf muscles and plantar hyperesthesia but no muscle atrophy. In addition there was an icteric tint to the sclerae, and a firm but tender liver was palpable five fingerbreadths below the costal margin. There were a few dilated lateral abdominal veins, but ascites was not present and the spleen was not palpable. Edema of the ankles was noted on admission but disappeared by the next day, and there were no signs of congestive heart failure. The patient was given the same diet and *vege*x as the subjects in group C. At the end of ten days no improvement was noted. The patient was then given, in addition, 10 mg daily of natural crystalline vitamin B₁ by intravenous injection for thirty consecutive days. On the forty-first day of study, after the administration of 300 mg of crystalline vitamin B₁, the only improvement in objective signs of polyneuritis was the disappearance of the tenderness of the calf muscles. Beginning on the forty-second day, 50 mg of natural crystalline vitamin B₁ was administered daily for five consecutive days. At the end of this period the plantar hyperesthesia had disappeared and the patient was able to walk unassisted but on a wide base, the knee jerks and ankle jerks, however, remained absent. Jaundice had disappeared but the liver remained palpable five fingerbreadths below the costal margin.

In this subject the improvement in the objective signs of polyneuritis was limited to the disappearance of muscle tenderness and plantar hyperesthesia. Functional improvement was limited to an improvement in strength. On admission the patient could not stand

unassisted. At the end of forty-seven days of treatment, during which time he had received 610 mg of natural crystalline vitamin B₁, he was able to walk unassisted, without a cane, but on a wide base. The lack of improvement in the objective signs of motor nerve involvement we believe to be due to relatively irreversible anatomic changes in the peripheral nerves occasioned by an acute vitamin B deficiency.

CASE 49—A "man about town," aged 39, was admitted to the hospital Feb 1, 1936, because of complete inability to care for himself. He had been drinking about one quart of whisky daily for the past ten years. His appetite had been maintained until five months prior to admission, when he noted its failure, and for the past month he had eaten very little. Examination six months prior to admission showed no evidence of polyneuritis, but on admission there was absence of all tendon reflexes in the upper and lower extremities, with a bilateral foot drop and weakness of the hand grips. There were no signs of congestive heart failure, but the liver was palpable, firm and slightly tender two fingerbreadths below the umbilicus. There were a few visible lateral abdominal veins. The spleen was not palpable. A fluid wave and shifting dullness could not be elicited. The patient was given the diet and *vege*x received by group C, plus 20 Gm of a vitamin B concentrate¹⁴ by mouth, bringing the vitamin/calory ratio up to 14. Within two weeks the foot drop, muscle tenderness and stocking hyperesthesia had disappeared. The biceps and triceps jerks had returned, but the knee jerks and ankle jerks remained absent. The vibratory sensation remained absent in the toes, but the position sense was intact. At the end of twenty-one days the knee jerks had returned and the patient was able to walk on a slightly widened base. He was then treated as an outpatient, taking approximately the same diet and vitamin B as in the hospital. By June 1 all signs of polyneuritis had disappeared except absence of ankle jerks. The liver was now palpable only on deep inspiration. This regimen was continued till December 15, at which time the patient was given 50 mg of natural crystalline vitamin B₁ by intravenous injection three times a week for fifteen doses. The ankle jerks were still absent at the conclusion of this period.

This case illustrates an excellent sensory and motor response in a subject having an acute polyneuritis in all objective manifestations except a return of the ankle jerks. These are probably permanently lost, owing, we believe, to the severity of the vitamin B deficiency and the resulting irreversible neural lesion.

COMMENT

Additional evidence that vitamin B deficiency is the cause of the polyneuritis of the alcohol addict is furnished by a comparison of the response of subjects in group C and group D. The more rapid and complete improvement of the latter is definite. Since the two groups received identical weighed diets and oral vitamin B supplements, the greater response of group D can be attributed only to increasing the vitamin B intake over that received by group C, or to chance. In a previous study Jolliffe and Colbert¹¹ attributed the improvement of subjects in group B, as compared with the lack of response in group A, to doubling the vitamin B intake without otherwise changing the diet. They were at that time unable with certainty to attribute the greater improvement in group C than in group B solely to the increase in vitamin B, since not only the vitamin B intake of group C was doubled as compared with group B, but calories, protein, mineral salts and the other vitamins were also increased. Since group D in the present study received the same diet and oral vitamin B supplement as group C in this and in the previous study, we now believe that the greater improvement in group C as compared with

group B was due primarily to the increase in vitamin B, since the improvement was roughly proportional to the vitamin B intake we do not believe that chance significantly influenced our results.

Although motor and sensory improvement occurred in patients receiving daily twice the predicted vitamin B requirement of a subject weighing 60 Kg, this was minimal. It was not until four times the predicted requirement was given daily that absent ankle jerks were observed to return within twenty-one days. We therefore believe that the dosage of vitamin B as frequently advised in the literature of many drug houses has been far too small. For curative results in vitamin B deficiency we believe that the intake of vitamin B should never be less than four times the patient's predicted requirement. We cannot say that 10 mg of crystalline vitamin B₁ parenterally administered under these conditions is the optimum dosage. One-half the amount might have given equally good results, but doubling the 10 mg dosage may still further enhance the results. These possibilities are under investigation. At present the determination of the optimum curative dose can be arrived at by clinical evidence only. A practical chemical procedure for the determination of vitamin B saturation, in place of the biological assay method of Harris and Leong,¹⁵ is needed in order that each subject's vitamin B excretion in the urine may be followed at daily intervals over a long period of time. While such a method is desirable in following the mild cases of polyneuritis, it is almost indispensable in determining what the optimum therapeutic dose of vitamin B should be in those having a more severe polyneuritis. At present when the objective signs of polyneuritis fail to improve we are unable to decide whether the neuritis is on the basis of vitamin B deficiency, and, if so, whether the pathologic processes have gone on to irreversible changes or the patient is not yet saturated with vitamin B. Such problems occurred in subjects 47 and 48 after we had administered 300 mg of crystalline vitamin B₁ intravenously, in addition to an oral intake of approximately four times the predicted requirement, and in subject 49 after eleven months of oral treatment. It may be that most of the vitamin B subsequently administered could have been recovered in the urine.

The rapid return of reflexes as noted in subjects 7,¹¹ 40 and 41 may occasion some surprise. This rapid recovery is not without precedent in the clinical experience of neurologists in other forms of neural disease, such as Landry's ascending paralysis.¹⁶ In the avitaminotic B pigeon a complete inability to stand or fly may be replaced by normal activity within an hour following parenteral administration of vitamin B. When recovery follows so dramatically it is inconceivable that actual nerve degeneration could be present. This statement is supported by numerous pathologic studies.¹⁷ These observers rarely found significant histologic changes in acute experimental avitaminosis B. However, vitamin B unsaturation does lead to changes of the chem-

istry in the neural system.¹⁸ These changes could reasonably produce physiologic alterations sufficient to cause areflexia and other signs of polyneuritis and, at the same time, be rapidly reversible following saturation with vitamin B.

The disappearance of the ascites (in case 46) during the course of vitamin B therapy may have been due to a spontaneous remission. Though spontaneous remissions do occur in subjects having cirrhosis of the liver they are relatively rare, and we are inclined to believe that vitamin B played a part in this remission now lasting over eleven months. In subject 49 the liver was palpable below the umbilicus, but four months later it was palpable only on deep inspiration. This occurrence is not at all unusual in our alcohol addicts treated with vitamin B. It is possible that these large livers were not due to fatty cirrhosis but to congestive heart failure. If the latter is the true explanation, the large palpable liver was the chief or only sign of congestive heart failure in most of these subjects. We have treated five other subjects having cirrhosis and ascites. In four subjects, none of whom had polyneuritis, there was no clear evidence of beneficial response. In the fifth subject, who had polyneuritis, a beneficial response seemed to follow. Many subjects carefully studied and controlled over long periods will be required to establish the value of this therapeutic procedure in liver cirrhosis.

Although there was no reason to expect a difference in response to the administration of synthetic and natural crystalline vitamin B₁, we have, since the synthetic product was available, alternated our subjects between the two products. Equally good and negative results were obtained with the two, both in the subjects reported in this study and in our unreported cases.

SUMMARY

We have observed an additional group of seventeen alcohol addicts having uncomplicated mild polyneuritis who were given diets containing four times the predicted vitamin B requirement of a subject weighing 60 Kg. Alternate subjects were given by intravenous injection 10 mg daily of either natural or synthetic crystalline vitamin B₁ for ten days. By every method of comparison the response of those receiving the crystalline supplement was better than that of the control group. Four histories selected from our group of subjects with more than a mild degree of polyneuritis illustrate problems encountered in the treatment of such subjects. Some patients having cirrhosis of the liver apparently respond by improvement to vitamin B therapy.

CONCLUSIONS

1 Vitamin B deficiency is the primary cause of the polyneuritis of the alcohol addict.

2 Improvement in the objective signs of polyneuritis in the alcohol addict varies directly with the vitamin B intake up to a point of optimum dosage, which, though not as yet determined, is definitely more than four times the predicted maintenance requirement.

ABSTRACT OF DISCUSSION

DR. GEORGE R. COWGILL, New Haven, Conn.: My experience in this field has been with experimental animals. I note that the patients were placed on basal diets with a fairly accurately determined vitamin B content, and known doses of the pure vitamin given in addition. These efforts to quantitate the clinical work constitute a real step forward. In our work with pigeons we learned that we could not obtain a satisfactory

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curative test unless we used a dose from three to five times the minimum daily weight-maintenance dose. It is perfectly obvious that the clinical experience just reported accords well with our animal experience. I have frequently had occasion to advise my clinical colleagues to use much greater doses of vitamin B₁ in their work, and this advice was based on our experience with experimental animals. Drs Goodhart and Jolliffe reported that occasionally a patient would show dramatic improvement following the administration of liberal doses of vitamin B₁. This is quite comparable to what has been observed in experimental animals. However, not all patients responded so well. The same dose of vitamin B₁ administered to our dogs did not always yield the same results. Evidently we could not gauge accurately enough the severity of the state of extreme vitamin B₁ deficiency. It was for this reason that I gave up trying to assay chemical fractions for vitamin B by a curative method. Some of the patients received as much as 10 and in some cases 50 mg daily of crystalline vitamin B₁. If it is assumed that the average man requires about 1 mg daily, these seemingly large doses are from ten to fifty times the daily minimum. From experience I should say they are not excessive. Doses of this order of magnitude in relation to the minimum have been widely used with experimental animals usually with the desired success. If one were to attempt to give such doses of vitamin B₁ in the form of vitamin-rich foods or the cruder concentrates, simple calculation will show that perfectly enormous amounts of these materials would have to be given. With the pure vitamin now available for clinical use, I have little doubt that trials of it in the clinic in these larger and appropriate doses will reveal numerous conditions as involving a serious lack of vitamin B₁ as at least one feature of the syndrome in question. Can too much vitamin B₁ be given? Recent tests by Molitor have shown that it is possible to kill mice, rats, rabbits and dogs by administration of enormous doses of crystalline vitamin B₁. The lethal dose appears to be from 25,000 to 50,000 times the daily normal requirement. If it is assumed that these results may be translated to the human species, it appears that the lethal dose for man would be from 25 to 50 Gm of the pure vitamin.

DR MARTIN G VORHAUS, New York. Drs Goodhart and Jolliffe have added another chapter to the work on alcoholism which has been in progress at Bellevue Hospital for some time. This paper is an important step forward toward a better understanding of vitamin B₁ therapy. The authors have presented convincing evidence that large doses bring a greater percentage of good results in polyneuritis than moderate or small doses. In our first communication my co-workers and I suggested a daily dose of 10 mg of vitamin B₁ in severe cases or in those of long standing. This dose has been employed in many of the reported cases. Some questions with regard to vitamin B₁ therapy that have been raised are: What are the symptoms of an overdose of vitamin B₁? Is there a toxic dose of vitamin B₁? The authors have given 50 mg of vitamin B₁ daily by intravenous administration and have not noted any signs or symptoms of toxic effect. This is in accord with our experience. We have given as high as 90 mg daily by mouth without observing any untoward effect. From these clinical observations it may be concluded that very large doses of vitamin B₁ may be given safely. Of especial interest to me is the occurrence of certain side effects of vitamin B₁ therapy. I refer to such clinical observations as failure of reaccumulation of ascites and the reduction in the size of the liver in certain cases. That such changes may be only coincidental is admitted but it is very important to point out that the therapeutic value of vitamin B₁ is undergoing critical study at present and its limitations are still not clearly defined. Weiss and his associates have reported changes in cardiac function in some cases on vitamin B₁ therapy. We are studying alterations in bone structures in cases of gout and certain types of osteoarthritis on large doses of vitamin B₁ over a long period of time. There is a great deal yet to be learned about vitamin B₁ therapy, but one point is becoming more definite—as the authors have indicated—that often the dose of vitamin B₁ is too small or administered for too short a period to serve as a basis for thoroughly evaluating its benefit in a given case.

DR TOM D SPIES, Cincinnati. In the past six years I have been making clinical observations along this line. I can corroborate almost everything that the authors have said.

They have gone much farther than I in many respects. There are a few practical points that might be accentuated. I feel that the dose of 10 mg, or four times that, is very small. In other words, I think they have not gone far enough, because I have had to give as much as 500 mg on several successive days to get an alteration in cases such as they classed as irreversible. There are two factors, I think, that enter into the treatment of these particular persons: one is the size of the dose and the other is the factor of time. I am not at all sure that the authors gave an adequate dose, and some forty-odd days is not long enough in many of the cases. It takes months, literally months. In general, I am sure that alcoholic polyneuritis is in part at least a nutritional disease, and I am equally certain that vitamin B₁ is a factor.

DR ROBERT S GOODHART, New York. We are attempting by various methods to determine the optimum dose of vitamin B₁. We are at present using 5, 20 and 50 mg doses in an effort to determine this point more accurately. There is no reliable chemical method of analyzing the urine in determining whether or not these patients are saturated with vitamin B₁. There is evidence that the polyneuritis due to vitamin B₁ deficiency is in the early stages a physicochemical phenomenon. We feel that when rapid improvement occurs following vitamin B₁ therapy this is due to the action of vitamin B₁ in rectifying these physicochemical alterations. When rapid response does not occur and there is no obvious change in the polyneuritis over a three to four weeks period we are inclined to believe that there has been some actual anatomic degeneration. We also wish to point out that these alcohol addicts are not on a diet deficient alone in vitamin B₁ and therefore other deficiencies may and do complicate the picture. For example, it has been demonstrated by men in this work that vitamin A deficiency may be responsible for a peripheral neuritis.

THE TEACHING OF BODY MECHANICS IN PEDIATRIC PRACTICE

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The purposes of this paper are first to reemphasize the importance of body mechanics as a necessary part of preventive pediatrics, second to review the mechanics of the body which determine efficiency and third to present a simplified and practical method of teaching which can be carried out in regular office practice and which has produced highly satisfactory results in my hands over a period of several years.

Efficient use of the body has so evidently a favorable effect on the general health and well being that it is accepted as an axiomatic point of departure by most writers on the subject. The bad effect of poor general health on body mechanics, with its attendant lack of muscle tone, lowered threshold of fatigue and lessened available mechanical and emotional energy, is also evident. It seems unnecessary to argue that poor body mechanics and ill health form a truly vicious circle, each in turn increasing the other.

The body, like any other machine, can be mechanically efficient only when all its parts can be most readily maintained in equilibrium. "Equilibrium maintained by the body in upright standing position is an active and not a passive one."¹ The starting point for efficient graceful strong movement must be equilibrium. Energy

Owing to lack of space the illustrations have been omitted here. They will appear in the author's reprints.

Read before the Section on Pediatrics at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 9, 1937.

¹ Phelps Morgan Winthrop and Kipling Robert J. H. *The Diagnosis and Treatment of Postural Defects*. Springfield, Ill., Charles C. Thomas, Publisher, 1932. (a) p. 68, (b) p. 71, (c) p. 111, (d) p. 16, (e) p. 15, (f) p. 120, (g) p. 148, (h) p. 76, (i) p. 149, (j) p. 30.

used to maintain a too unstable active equilibrium is wasted and must therefore be subtracted from that available for physical activity and for nervous stability. Only in the fully erect posture (upright equilibrium) is full expansion of the lungs possible. Goldthwait^{1a} has pointed out that the viscera are slung from the cervical fascia, by way of the attachment of the pericardium to the diaphragm and the diaphragmatic attachment of the abdominal viscera. Only when the dorsal and cervical portions of the spine are fully extended are the viscera raised to the highest possible (best functional) level. "The position of greatest economy, which at the same time allows fullest play of the shoulder girdle and arm muscles is therefore the fully erect position with the neck line perpendicular and chest somewhat elevated. The dorsal erector spinae as well as the cervical muscles can hold with greatest firmness when summation of their pull is—a straight line."^{1b} When faults in body mechanics become sufficiently great the stress produced causes pain, but long before the threshold of pain is reached the nervous system is irritated to a highly unfavorable degree. On the contrary, a balanced erect carriage, easily attained only after faults in muscle balance have been corrected, eliminates the irritating reflexes of strain. Heads up! affects the emotional as well as the physical level, and man's erect posture as well as his brain and his hands has no doubt assisted him in attaining his dominant place among the creatures of the earth.

A clear understanding of the mechanics of the human body in rest and in motion must rest on certain fundamental principles.

1 The body is subject to the laws of gravity, and maintenance of good posture with the least muscular effort demands that the body be arranged, as nearly as possible, symmetrically about a vertical line passing through the body's center of gravity. In other words, to maintain the upright posture each part of the body must be counterbalanced by another part with an equal moment of force (moment of force = mass \times horizontal distance from center of rotation) or by muscular contraction sufficient to balance the inequality. This indicates clearly that when, for any reason, some part of the body is extended too far from the center of gravity in a horizontal direction another part will be extended too far in the opposite horizontal direction to restore balance, adjusted by the semicircular canals to maintain the visual plane parallel to the earth's surface.

2 All skeletal muscles are arranged in pairs as antagonists, i. e., for every flexor there is a corresponding extensor. These antagonistic muscles are at rest only when they are simultaneously relaxed, which is possible only when the part which they move or support is in equilibrium. Any muscle which has the linear distance between its origin and insertion shortened takes up the slack thus allowed and increases both in cross-section and strength, while any increase in length or stretching produces a corresponding decrease in strength, with a corresponding decrease in cross-section. In general the strength of a muscle varies directly with its cross-section and indirectly with its length. Any advantage which a muscle gains over its opponent increases steadily—the strong muscle gains and the weak muscle loses strength—thereby increasing the departure from equilibrium, with the production of increasing deformity. Certain muscles, because of their great strength and because they are shortened when the body is in a habitual incomplete upright posture, in a long continued sitting posture, especially if slumping is added, or in

an incorrect lying posture, are most frequently able to gain and increase their advantage over their opponents. In general, these are the muscles which were of greatest use when our ancestors traveled on all fours and those which must exert the most force in maintaining the active equilibrium of the body in the present upright posture. The psoas and pectoral muscles are an example of the first group and the gastrocnemius of the second.

3 All deformities, with the exception of those apparent ones which represent a stage of development in the growing child, tend to increase. The reasons for this increase are as follows. The deformity allows the shortening and therefore the gain in strength of muscles over their opponents, growth takes place in the direction of use (Wolff's law^{2c}), any posture or method of movement tends to become implanted in the kinesthetic sense as a habit, generally it is easier and more comfortable to rest and move with a deformity than against it toward correction, and in the young, growing child, with his elastic tissues and his great skill for learning new, substitute stances and movements, deformities, even though considerable, rarely cause sufficient discomfort to make their correction mandatory.

4 Ontogeny recapitulates phylogeny in the development of body mechanics as truly as in other aspects of growth and development. Every child must learn to sit up, to stand upright and to walk and run as a biped. His level of skill may stop at any of the stages leading toward perfection in these skills as truly as it may in music or mathematics. Beethoven's Fifth Symphony is not for beginners, and higher mathematics does not yield to the multiplication tables alone.

As in all other development of the human being, heredity and environment have the principle roles. Heredity determines the quality of the body with which he begins life and the energy or "spirit" which will give him the urge "to strive forward toward perfection in all things," while environment contributes the conditions which will aid him in his upward struggle or place obstacles in his path. The ideal environment is that which enables him to make the most of his hereditary possibilities. Skill in standing, walking, running, sitting and relaxation, all of which are so useful in everyday living and a lack of which allows so much injury to the body, surely is of sufficient importance to warrant one's best efforts as teachers of parents and children.

That pediatricians and other physicians are interested in the body mechanics of children is evident from the number who prescribe some form of corrective shoe for many of their patients. This interest, with unfortunately its attendant prescribing, has spread like a contagion to teachers of physical education, manufacturers and even salesmen of shoes. A salesman in my community to whom I formerly sent many children because he sold good shoes and fitted them well has recently been telling mothers that he knows as much about feet and legs as any one in the world.

Every physician who cares for children should be interested in their feet. He should teach mothers that short socks and short, ill fitting shoes may cause irreparable damage to growing, easily deformed feet, that children under 7 years of age rarely if ever complain of short shoes but walk with the feet exerted and pronated to relieve their toes from pressure—thus forcing the feet to bear the weight of the body too far medially on the inner borders of the heels and on the first metatarsal.

² Sweet, Clifford. The Natural Development of Infants with Special Reference to the Development of the Function of Walking, and Feet. Shoeing. California * West. Med. 27: 151 (Aug.) 1927.

tarsal bone, while nature designed the feet to bear weight centrally on the heel and only slightly more on the first metatarsal bone than on the fifth, that with the feet thus forced into eversion and pronation not only is it impossible to use the full grasping powers of the feet in walking but the foot in this position must take off over the head of the first metatarsal bone instead of over all the toes.² Shoes with soles so rigid that the child cannot bend them force him to take off in a similar though somewhat less pronounced manner and so contribute to the very deformities they are designed to correct, i. e., eversion and pronation.² The arch of the shoe and the arch of the foot should be of exactly the same length, otherwise the foot and the shoe do not "hinge" together in walking and the plane of weight bearing (a plane is determined by three points) of the foot and the shoe do not coincide, forcing the foot to make internal adjustment, with resultant strain. All shoes should be built on combination lasts, since all children have combination feet, with greater width in the forefoot than in the heel. If the child has an unusually narrow heel, one can make the shoe grasp it more firmly by cementing one or more layers of leather within the counter.

However, while every effort should be made to protect the feet from deformity and while it is true that the mechanics of the standing or walking body cannot be correct when the feet are not functioning correctly, it is necessary to realize that the feet only partly control and to a greater extent are controlled by and merely reflect the mechanics of the body as a whole in its relationship to gravity and the earth's surface. According to Stendler,³ in pathologic types of posture the deflection of the line of gravity in relation to the spine persists and results in abnormal relations to sacro-iliac, hip and knee joints, balance being ultimately recovered by the position of the feet. Therefore, while correction of the position of the feet alone has value it is not effective as a solution of the whole problem of body mechanics. To approach the problem with sole or undue emphasis on the feet is to attack it where its ill effects are most obvious rather than where its causes can be most readily altered. Correction of the feet alone is a partial and incomplete solution because its effect is not sufficient to correct the entire body, especially in the young child, whose elastic and readily molded tissues can completely take up the entire correction in nearby structures, with the result that too small an effect is made on the body as a whole. Failure to realize that this method of attack is superficial and concentrated on only one part of a general problem all too often causes both physician and parent to dismiss the entire matter with the thought, "Oh well, I've done my duty, I've wedged his shoes," with ultimate harmful results to the child.

Any attempt to understand the body mechanics of the growing child must be based on a thorough knowledge of the stages of growth and development through which, with minor variations, all normal persons pass between birth and adult life. The mechanics of the body must at each succeeding stage be interpreted according to the age and the level of growth and development which the individual child has reached. Observation of this progression is peculiarly the privilege of the pediatrician, because he alone sees large numbers of normal children over a period of years during which growth is rapid.

Every baby has bowed legs⁴ which will straighten in due time after he begins to walk unless he is allowed to have rickets, is deformed congenitally or by disease, is injured, or is one of those rare persons who through inheritance have an unusual form of leg structure. When I first wrote that all babies have bowed legs, I thought it was the result of the child's position during intra-uterine life. While bowing is established before birth, it is increased or at least maintained until after upright weight bearing begins by the baby's frequent strong plantar flexion of the feet while in full supination (fig 1), during which the muscles produce an outward thrust on the shaft of the tibiae. Most people I am sure, have noticed a baby's feet assume this position when he stiffens his body to cry or when, with delighted anticipation, he is waiting to be picked up. The comparatively strong grasping power of the baby's foot represents, I am certain, a stage of development which his tree-dwelling ancestors retained and the use of which in all probability made them permanently bowlegged. In that far off time ideals of manly beauty and feminine pulchritude no doubt demanded properly bowed legs, not to speak of the added safety when aloft afforded by an extra strong foot grasp. The Greek ideal of beauty, especially as shown in their statues of athletes, included a definite symmetrical out-bowing of the tibiae. During the months when the child is increasing or maintaining the bowing of his legs he is at the same time shortening and strengthening the gastrocnemii, the external rotators of the thighs and, to some extent at least, the glutei, preparing them for their important roles in the new adventure of standing upright, which is just ahead.

When the child first stands, stability is his first and only desire.⁴ To gain in stable weight-bearing ability his feet must give up something of their grasping power, at first the grasping power is made completely subservient, in that it is used only in the component parts which contribute to stability. After a stable stance has become habitual and easily maintained and walking has progressed beyond the toddle of the infant, the grasping power again rises in importance, to play an important part in the use of the feet as organs of locomotion.

This double function of the feet that is, weight bearing and taking an active part in locomotion, with weight bearing necessarily appearing first and being of greater importance throughout life, seems to me to explain the physiologic changes which take place from the time the child learns to stand until he is about 6 years of age. In order that he may stand, at first, the feet must make as stable a contact with the earth as possible. The base is broadened by placing the feet widely apart in eversion, thus giving enough lateral stability so that an infant rarely falls laterally. But eversion also makes pronation easier and, since the heel is narrow, added stability is gained by further pronation, until the entire ball of the foot comes firmly in contact with the earth. Furthermore, when the gripping action of the feet is used with the feet parallel, the inner borders are raised, while with the feet everted pronation takes place during gripping, and any increase in the distance between the everted feet forces them into greater pronation. When the child first stands he is unable to use full extension of any of his joints because when he does his center of gravity rises so high and is thrown so far forward that he falls face downward.

3 Stendler Arthur. *Mechanics of Normal and Pathological Locomotion in Man*. Springfield Ill. Charles C. Thomas Publisher 1935.

4 Sweet, Clifford Watson R. G. Stafford H. E. *Physiologic Changes in Posture During the First Six Years of Life*. J. A. M. A. 91: 1519 (Nov. 7) 1928.

Without full extension of the knee, the foot gains no support for its inner border from the *tibialis anticus* and *posticus*, while the *gastrocnemius* must contract strongly to help maintain the upright posture, thus laying the foundation for the powerful, short, overacting *gastrocnemius* muscles which are one of the obstacles to be overcome when one is correcting faulty posture in older children. The wide stance of the feet with incomplete extension of the hip joints locks the femur in internal rotation, thus further contributing to the concentration of weight on the inner borders of the feet.

Since any postural tendency is progressive until some force successfully opposes it, the internal rotation of the femurs, the outward rotation of the tibiae and the pronation of the feet increase normally until the child is 3 years old. All children at the age of 3 are knock kneed and have associated pronation of the feet. During the first three years the tibiae have lost their bowing because of weight bearing and because they are no longer subjected to the muscle pull previously mentioned. Throughout these years the child's weight increases faster than does his ability to carry it advantageously, thus keeping an overemphasis on the weight-bearing function of the supporting structures of the body, with an increasing tendency to continuation of the postural force lines then existing.

Gradually the process reverses itself. Growth slows up, relative strength increases and coordination and physical activity increase to the point where weight bearing becomes more nearly equalled in importance by skilful movement. Now antagonistic muscles come more evenly into play, the protuberant abdomen flattens, and the muscles of the abdominal wall are strengthened, the glutei develop rapidly, lessening the forward inclination of the pelvis, and in turn the external rotators of the thigh shorten, with distinct outward rotation of the femur and less eversion of the feet so that at about the age of 6 years knock knees have become straight and pronation has greatly decreased.

Therefore I cannot agree with Phelps¹⁴ that the pronation seen in the feet of all preschool children is environmental. If it were due to environment there would be more exceptions than there are, and, incidentally, the only notable exceptions that I have seen have been small, underweight children who for some reason other than lack of proper food, such as congenital heart disease, grew very slowly. This observation seems to bear out my idea of the close relationship between rapidly increasing weight and the normal posture of preschool children. Neither can I agree that the deformities of the feet during the preschool age are contributed to adult posture, except as they remain the most obvious result of childhood posture which has not been changed far enough toward the best obtainable adult posture.

Certainly all children do not need to wear corrective shoes, any more than all children should wear shoulder braces while the round upper part of the back is normal or an abdominal support during the stage of infancy when the abdomen is naturally protuberant. As Phelps says so well,¹⁵ "Shoulder braces and abdominal supports should not be used for prevention because muscles which are too long supported do not develop." I see no logical reason for not applying the same teaching to the feet. Corrective shoes should be worn only to correct a definite intrinsic deformity and should be discarded as soon as possible. The greatest care should be taken to prevent any interference with the function

of the foot while it is held in correction. If a shoe which compels the child to stand with his feet in the ideal weight-bearing position is so rigidly constructed that the feet cannot be used normally in walking and running, the net result is harmful to the child. Again, if the foot fault is not intrinsic but is a compensation for imbalance in another part of the body, unless that imbalance is of minor degree correction of the feet alone will accomplish little. For example, if the feet are pronated because of the pull of short calf muscles, correcting the pronation of the feet alone will not stretch the calf muscles sufficiently and will affect general body mechanics very little. If pronation is a result of long weak calf muscles, correction must be aimed primarily at shortening these muscles if it is to accomplish its purpose, and in older children this correction must be supplemented by the correction of mechanical faults in the entire body.

"The knowledge of correct posture and body mechanics can and should become a part of the daily life. It is only in this way that any scheme or branch of physical education can justify its purpose."¹⁶ To bring about this highly desirable condition among his patients, the physician must have (1) a clear definite idea of the best posture and use of the body which can be attained, (2) a clear understanding of the obstacles within the body as well as those of environment which must be overcome if large numbers of children are to arrive as nearly as possible within the ideal state, (3) a sound simplified method of teaching which can be understood by parents and children and which for practical purposes is not too time consuming to be used in office practice.

Among the children whom I see I rarely find one whose idea of posture is not a strained unnatural position to be assumed for a short time while he is undergoing inspection. When he is asked to stand, the inner borders of the feet are clamped together or turned out and the influence of the military posture is shown very evidently in the retraction of the shoulders without any attempt to correct the back, with only a partial correction of the position of the head and with little or no attempt to change the inclination of the pelvis. The military posture is not a normal posture but only an incidental upright posture designed for quick starting.

The ideal upright posture is (1) feet parallel at a comfortable distance apart with the weight voluntarily shifted toward the fifth metatarsal bone if pronation is marked, (2) the pelvis rotated anteriorly, (3) full extension of the dorsal and cervical portions of the spine, with consequent elevation of the chest and the head, and (4) the weight carried slightly forward (fig. 2).

The assumption of this standing posture demands effort only for the placing of the feet, the rotation of the pelvis, the elevation of the head and the shift of the body weight forward. With the feet so placed and the weight of the body forward, rotation of the pelvis automatically fully extends both hips and knees, rotates the thighs laterally, decreases lumbar lordosis and allows the lower part of the abdomen to flatten. It is easier to rotate the pelvis with the weight thrown backward, but in this position the knees are flexed because of the strain thrown on the iliofemoral ligament. In turn reduction of the lumbar lordosis causes a compensating reduction of the dorsal kyphosis. Elevation of the head to its full height completes the extension of the dorsal and cervical portions of the spine with consequent elevation of the thoracic cage. Much the

same result can be obtained by contraction of the abdominal muscles and elevation of the chest, but when this is done the position can be maintained only with great effort, breathing is interfered with and elevation of the thoracic cage tends to throw the center of gravity forward, with a consequent increase in lumbar lordosis. When a child first attempts to stand in correct upright posture the position is strained and awkward, but it becomes increasingly easy and comfortable as the faults in posture are corrected.

Besides the ease with which this posture can be taught because of its simplicity, it has the very great advantage of being easily carried over into walking, running and sitting. The muscles which rotate the pelvis anteriorly cannot be held taut when one is walking but, having been strengthened and shortened in correct standing, they tend to hold the pelvis in anterior rotation and, when one is walking correctly, that is, with the feet pointed forward and the head carried to its full height, these muscles, of which the glutei are the most important, are contracted strongly with each step and so automatically strengthened. On the other hand, walking with the feet everted causes the leg to be swung forward from the hip with little or no action on the part of the glutei, and in consequence development lags. Walking and running should differ only in length and cadence of stride. When the head is held at its greatest possible height by a fully extended cervical part of the spine, the sitting posture cannot be other than correct.

The obstacles which most commonly must be overcome before the complete upright posture can be attained are (1) short calf muscles or, occasionally, too long calf muscles, (2) short hamstring muscles (biceps semimembranosus, semitendinosus), (3) weak, undeveloped external rotators of the thigh, (4) weak, underdeveloped glutei, (5) weak, undeveloped muscles of the abdominal wall, (6) strong, overdeveloped erector spinae muscles in the lumbar region and correspondingly weakened members in the dorsal region, (7) strong, short, overdeveloped anterior shoulder girdle muscles and (8) forward thrust of the head with shortening of the upper trapezius and splenius muscles. Much can be done to prevent these deformities in young children, and they can be corrected or greatly reduced in nearly if not all normal children later in childhood.

In the hurry and bustle of modern life many children are spending too much time in the upright position. Fatigue always causes the child to slump in the posture with the lowest possible center of gravity. When this faulty posture is noticed, all too often a dancing class is added to his already too large burden of activities. Some one may notice the pronation of feet and prescribe corrective shoes which interfere with the function of his feet. He may have an acute illness and, while not yet fully recovered, he may become a victim of fatigue or some muscles may gain an advantage over their weaker opponents. His bed may not be flat and firm, forcing him to sleep in a posture that shortens some muscles and stretches others. His chair may be too deep and too high, so that when he sits in it the weight of his dangling legs pulls his shoulder girdle forward and thrusts his head forward. His teacher of physical education and his parents may still have the military posture in mind and be constantly saying "Stand up! Sit up! Throw your shoulders back!" A child should not be told to stand up without being taught to do it any more than he should be ordered to do his arithmetic without preliminary instruction in fundamentals.

The ideal adult posture is one which is completely upright. Man's upright posture has developed from that of the quadruped. The posture of childhood is not a static one but is changing from year to year, moving constantly toward the adult or completely upright type. The progress of the child toward the best development possible in adult life is based on his hereditary racial and individual characteristics and on the modifications which the sum of environmental forces can produce.

Mechanically, the greatest and most fundamental change which takes place in the process of evolution from quadruped to biped is the rotation of the pelvis which must take place to allow full extension of the hindlegs. The assumption of the upright posture and consequent freeing of the forelegs from weight bearing has permitted profound changes in then function. The greatest evolution in the functions and development of muscles has been in those associated most directly with the changed angular relationship of the pelvis to the legs and spine.

Consequently, any attempt to train the child to assume the complete upright posture must make the ability to rotate the pelvis anteriorly its first and most fundamental object. When the pelvis is not in full anterior rotation the fully erect posture cannot be attained except by means of exaggerated, mutually compensating curves of the spinal column and malposition of the legs and feet. Conversely, when full anterior rotation of the pelvis has been made possible and has become habitual by stretching of the opposing short muscles and strengthening of the assisting weak muscles and the necessary poise has reached fixation in habit, complete upright stance and balanced muscular movement are natural consequences. As a matter of course, stretching, strengthening and training in poise must be extended to all parts of the body to make it possible for the entire body to reach upright equilibrium. For example, short anterior muscles of the shoulder girdle must be stretched sufficiently to allow the shoulder girdle to gravitate posteriorly into balance above the anteriorly rotated pelvis. Weak posterior muscles of the shoulder girdle must be strengthened to prevent the shoulder girdle from falling forward in fatigue to force the pelvis back into posterior rotation to maintain balance.

The great number of normal children need no attention to their body mechanics during the preschool years, except that they must be properly fed and protected during and after acute illness and that no mechanical force, such as that supplied by shoes, bed and chair and especially by overfatigue must be allowed to interfere with normal development. However, even during these years many children need help which can be given most effectively and economically at this time in the child's life. Nasal obstruction interferes with the development of the thorax and should be remedied as soon as it is apparent by removal of the adenoid growth and relief of allergic rhinitis. Malocclusion of the jaws that evidently interferes with mastication or breathing should be corrected by the orthodontist even though some further correction may be needed after the permanent teeth are in. An attempt should be made to strengthen the muscles of the abdominal wall if they appear to be underdeveloped and especially if wide separation of the recti is present. This is best done by encouraging the child to play at the game of pulling himself into a sitting position without the assistance of the arms from a supine position on a firm flat surface with his legs widely separated and held firmly

against the supporting surface by an adult. The wide separation of the legs is important in that it prevents the psoas muscles from pulling in a straight line and makes stronger contraction of the muscles of the abdominal wall necessary (fig 3).

Certain infants who walk late and stand with the feet in extreme pronation and eversion have such long calf muscles that the feet can be dorsiflexed far beyond the normal angle, often until the dorsum of the foot is brought almost into contact with the anterior surface of the leg. These children begin walking very soon after being fitted with shoes having heels of suitable height, usually from one-half to three-fourths inch, and in time the calf muscles shorten sufficiently to correct the pronation (fig 4). The shoes for this purpose must have sufficient rigidity to stabilize the heel but should not be so inflexible that the foot cannot "lunge" and grasp easily during walking. Elevation and advancement of the inner borders of the heels lessens pronation and eversion of the feet, but the height of the heel prescribed is far more important. Elevation or wedging of the inner borders of the soles interferes so seriously with the flexibility and grasping power of the foot that it is mentioned only to be condemned.

Certain other children early in life show a tendency to too great shortening of the calf group. Aside from their hereditary tendency this is brought about by the extra work thrown on these muscles when a poor habitual upright posture continually keeps the center of gravity of the body too far forward. The tendency toward the shortening of these muscles is normally opposed by the force exerted by the plantar flexors of the feet, but this opposition is interfered with too frequently by short or rigid shoes or is not developed because too little walking is done. Often the feet of these children show early but unmistakable signs of becoming the rigid claw or pes cavus type of later life, no other type of deformity of the foot can produce so much human misery. Often the child with this type of foot has been complimented in classes in physical education because of his "wonderful arches" even though his contracted toes, flattened anterior transverse arches and inability to dorsiflex or extend the foot are already too apparent.

If deformity is not advanced it may be corrected by the removal of such obstacles as incorrect shoes and by manual stretching of the calf muscles and plantar tendons and fascia, supplemented by stretching exercises and the natural corrective value of full function. Correction is made more rapid and certain, if the deformity is advanced, by fastening a cleat, usually about one-half inch (1 cm) in height, across the sole of the shoes directly beneath the metatarsal heads, so that with each step calf muscles and plantar structures are stretched (fig 5). It is well to remember that the calf muscles are too short unless the foot can be dorsiflexed to at least a right angle and ideally through an additional fifteen degrees.¹¹

From the beginning one should let nothing interfere with the child's learning to stand and walk with the feet parallel. Then if, with full freedom, he walks or stands with his feet everted, his muscle balance should be studied and corrective measures and teaching begun.

During the earlier school years the normal healthy child needs only good nutrition, protection from fatigue, prohibition of the injunction "Shoulders back," a seat in which he can sit with the feet planted squarely on the floor, a firm, flat bed and sufficient freedom to make full use of his great store of physical energy. I am

convinced that children should not attend school more than a half day until the fourth grade is reached. Not only should the school desk be of the proper height but the spacing between the desk and the seat should be such that the child can lean forward from the hips instead of dropping the head and shoulder girdle forward when working.

While the gluteal muscles develop steadily when walking is done with the feet parallel, they are seldom equal in strength or development to their principal opponents, the psoas muscles. Since the complete anterior rotation of the pelvis requires a strong muscular pull, principally by the glutei, and since incomplete rotation can be and is commonly compensated for by increased lumbar lordosis, which allows shortening and therefore further strengthening of the psoas muscles, there is a natural reason for this inequality to persist and increase. Therefore, any exercise which will teach the child to rotate the pelvis anteriorly and so strengthen the glutei will prevent excessive lumbar lordosis and correct it after it has already become established. Phelps warned against reversing the lumbar curve as a result of extreme abdominal and gluteal contraction.¹² However, I have seen no evidence of this overcorrection in children. I think it can be avoided by depending entirely on the spontaneous contraction of the abdominal muscles which takes place when the pelvis is rotated anteriorly and the chest is lifted and by being careful that the center of gravity of the body is well forward when the pelvis is actively rotated. He has observed correctly that it is easier to flatten the lumbar curve with the weight displaced backward, but complete extension of the knees is then impossible.¹³ Study of his figures shows the backward displacement of the center of gravity and the flexion of the knees without which in children I have not been able to flatten completely the lumbar curve.¹⁴ Some children when told to contract the glutei hyperextend the knees (back knee), and one must guard against this by insisting that the weight of the body be forward sufficiently without forward bending at the hips to make such hyperextension impossible against the resistance which is then offered by the quadriceps muscles. I know of no objection to making anterior rotation of the pelvis by contraction of the glutei the foundation of the early lesson which the child is given in body mechanics. I have found playing the game of putting a wooden tongue blade in the gluteal fold of the child and teaching him to grasp it firmly by narrowing the fold an excellent way in which to begin this instruction. If the child has difficulty in learning to contract the glutei it is well to do it first while he is lying prone and later when he is standing.

Complete anterior rotation of the pelvis cannot be accomplished with simultaneous full extension of the hips and knees against the resistance offered by too short hamstring and calf muscles. Stretching of the calf muscles has been described. An effective method of stretching the hamstring muscles is having assumed the correct standing posture, with emphasis on gluteal contraction, to bend forward from the hips, keeping the back flat, in an attempt to reach the floor with the finger tips. If the back is kept flat there is no strain on the lumbar or the sacro-iliac portion of the spine and the weight of the upper part of the body and the head act effectively to stretch the hamstring muscles. Unless there is marked disproportion between the respective lengths of the legs and the body, the stretching is usually sufficient when the child is able to touch the

floor with the finger tips without bending the knees or elevating the heels from the floor

After the feet, legs, pelvis and the lower part of the spine are in balance, correction of the position of the head completes the correct alignment of the body. When not prevented by shortened muscles, the upper part of the spine, the thorax and the upper part of the abdomen will follow the fully extended head up without conscious effort, leaving the full respiratory excursion of the chest unhampered and allowing the shoulder girdle and arms full freedom of movement as well as making possible the most advantageous use of their entire strength. As the chest rises the upper part of the abdomen flattens, the lower part having flattened with the anterior rotation of the pelvis, the dorsal kyphosis flattens in response to the lessening of the lumbar lordosis of the spine, the shoulder girdle rotates posteriorly into balance over the anteriorly rotated pelvis, and lordosis of the cervical part of the spine is practically obliterated.

The correct position of the head is the most difficult to teach, and faulty position of the head, with excessive cervical lordosis, often remains long after other faults are remedied. I have had more success with the method described by Haynes than with others I have tried. His method is to have the patient drop the head backward as far as possible and then revolve it up into full extension about an imaginary axis passed through the head from ear to ear. Resistance to full extension is offered principally by contraction of the anterior muscles of the shoulder girdle and shortening of the muscles which pull the head backward (upper trapezius, splenius and sternocleidomastoid).

The best single exercise that I know of to stretch the anterior muscles of the shoulder girdle, strengthen the posterior muscles and accomplish the same result in the neck is as follows. Lie prone on a firm surface with the head extended so that the forehead rests firmly on the supporting surface, clasp the hands together over the buttocks and draw the scapulae as near together as possible toward the midline, holding the scapulae firmly fixed and being careful not to rotate the head backward, raise the head and trunk as far as possible dorsally (figs 6 and 7).

SUMMARY

Body mechanics should have a prominent place in preventive pediatrics. The pediatrician has opportunity to see large numbers of normal children during the years of growth. The problems of body mechanics cannot be solved by a single formula, such as wedging the child's shoes, but must be considered on the basis of the mechanics of the entire body modified to fit the needs of the individual child.

The ideal upright posture is the one in which the body is arranged about a perpendicular line through its center of gravity so that the least possible muscular activity is needed to maintain it. The fully upright posture can be attained only when rotation of the pelvis from the position of the quadruped to that of the biped is complete.

The upright posture of the child is not so far removed from that of the quadruped as is that of the adult. Within certain stages of development during childhood protruded feet, bowed legs, knock knees, anterior rotation of the pelvis and other mechanical relationships are normal, representing a stage of progress toward the adult posture. None of these stages of development

should be considered abnormal unless they are not spontaneously corrected within the age limit to which they belong, and no method of correction should interfere with the development of the function of the entire body as a unit.

Children can be taught to use correct posture when standing, walking or sitting by correcting the position of the feet, rotating the pelvis anteriorly and extending the head to its full height. Emphasis on these three points alone produces excellent results. When certain muscles have become too strong and short, while their opponents are weakened and stretched, the correct exercises will stretch and strengthen them.

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ABSTRACT OF DISCUSSION

DR LLOYD T. BROWN, Boston. There are two points I want to emphasize: first, the recognition and, second, the treatment of postural deformities. To recognize a deformity, one must have a standard for comparison. I question whether any two pediatricians could agree on what is the normal or perfect child, and the reason for this is that no two children are ever built the same, and also what seems to be normal for a child at one age is not normal for the same child at another age. There are four points which are important in judging the body mechanics of a child or an adult. These are that: 1. There should be no exaggerated curves of the spine, the body should be as tall as possible without strain. The pelvis should be rotated anteriorly to reduce the lumbar curve. 2. The angle of the ribs just below the breast bone should be as near a right angle as possible. 3. The natural chest girth at the lower end of the breast bone should be about half way between the full inspiration chest girth and the full expiration chest girth. 4. The upper part of the abdomen, the epigastrium, should be well developed and larger and more prominent than the lower part, which should be flat below the umbilicus. There are, of course, many other things which can be looked for, but it has been found that if these four conditions are complied with, good body mechanics is present. It has also been found that although a child may be able to assume an excellent posture while the examination is being done, and yet have a very poor habitual posture, one or more of the foregoing conditions will not be present. As for the treatment this begins with the education of the child and the parents. He should be taught how to put his body in the position of good body mechanics and that the taking of this position should be a part of his daily work, such as in his recitations and in going from class to class. If he cannot assume such a position, he should be taught it in special classes just as he is taught any other subject in which he is deficient. The position of good body mechanics cannot be taken without using every muscle of the body, and if this position is taken often enough, not only will the muscles be exercised but there will gradually be produced the habit of good body mechanics. I want especially to emphasize, the importance of every physician training his eye to recognize good or bad body mechanics and not to fall back on the excuse that because practically every child he sees has faulty body mechanics it is normal for children, and, second, that it is our duty as physicians to see that our schools give as good an education to the bodies of our children as they try to do to their minds.

DR WINTHROP M. PHELPS, Baltimore. I think the most important point that Dr Sweet has brought out is the fact that in children of different ages there are postures which are characteristic for each of those ages. This is, of course, true, especially in younger children, and in very small children who have only just started to walk. There is not only the change from the lying down position to the erect position but the difference in diet of the child, which brings about a difference in the size of the abdomen. The young child's diet is to a large degree liquid and there has to be space for this liquid. When a child is older and the diet becomes less bulky, it is much simpler to maintain a flatter abdomen. If one tries to flatten the abdomen of a baby of 2, it simply bulges at the sides. There is therefore no point in attempting to expect that child to have a flat abdomen. In other words, children should

never be judged by adult postural standards. A second important point, I think, is the difference in the length of ligaments. In some children it is possible to bend the thumb back until it touches the arm. That is, of course, evidence of long ligaments in the wrist. It is usually but not always true that the ligaments all over the body are either all long or all short. The child with the long ligaments, when he sags, sags farther than the child with short ligaments, hence his posture looks much worse. There are some advantages in long ligaments, in that broken bones and sprains are less common. The child who apparently stands very badly, if he is healthy, is not necessarily a child with any worse fundamental posture than another child with short ligaments who appears to stand very well. Dr Sweet's paper is important and should be utilized in pediatric practice to a great extent.

DR CLIFFORD D. SWEET, Oakland, Calif. I feel that I take a somewhat unfair advantage of my discussants in a paper of this sort in that I have sent them a paper that is so long that I couldn't possibly present it all here. It is almost impossible to present this sort of subject. I have been mulling it over in my mind for several years and because I found it so difficult to present I put off doing it. What I have told you here, and what I am telling you in my exhibit, are the things I have worked out in practice and in teaching interns and residents. I think it cannot be neglected without doing detriment to the child. It is not a matter for which one can learn a quick and easy formula. It is something that if given thought and study, will become increasingly more interesting, and it will enable a physician to be of real service to many children.

THE ACTION OF SULFANILAMIDE IN RHEUMATIC FEVER

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The hypothesis that hemolytic streptococci have an etiologic role in many cases of rheumatic fever makes it highly desirable to determine the action of sulfanilamide in this disease. In undertaking this study, however, we understood that it might not be possible to evaluate its action with the same criteria that have been applied in using it in the treatment of such diseases as streptococcal bacteremia, meningitis or erysipelas, for if streptococci are indeed the causative agents in rheumatic fever they seem to act in a more complicated manner than as simple infectious agents. The present study therefore has theoretical as well as practical implications.

The literature has few references to this subject. Klee and Rome¹ observed a patient with acute polyarthritis and endocarditis who was treated with massive doses of prontosil and "cured" in eight weeks. They also observed some patients with acute polyarthritis who did not respond to salicylate and anisopyrine therapy but improved when given the disodium salt of 4-sulfamidophenyl-2'-azo-7'-acetyl-amino-1'-hydroxynaphthalene-3',6'-disulfonic acid (prontosil), but no favorable effect of this drug was noted in chronic arthritis, even of a secondary nature. Massell² found no beneficial effect from prontosil in two patients with frank rheumatic fever or in two others with chorea. Six rheumatic subjects who contracted hemolytic streptococcus infections were given this drug in an attempt to prevent recurrence of rheumatic fever, but

the disease developed in two and one died. The same number of relapses occurred in six control patients who were not treated with the drug. Peters and Harvard³ compared the complications in 150 patients with scarlet fever treated with parabenzylamino-benzene sulfonamide with those in a like number of patients not so treated (fifty of the latter had serum). Endocarditis developed in three of the first group, compared with nine of the second, in three of the first and ten of the second group rheumatism developed. There is no report of the action of this drug after the development of rheumatic symptoms.

The low toxicity of prontosil and sulfanilamide for laboratory animals has not been altogether paralleled in man and there is a growing list of cases of severe and even serious drug intoxication. Most patients have some degree of gastric disturbance, running the gamut from "indigestion" to anorexia, nausea and vomiting. Three fourths of a large series of patients observed by Long and Bliss⁴ had cyanosis. In some instances this is due to sulfhemoglobinemia⁵ and in others to methemoglobinemia⁶ but often its cause is undetermined.⁷ All patients taking therapeutic doses of the drug probably have some degree of acidosis, although it is not usually severe enough to be detected clinically. Both prontosil and sulfanilamide have definite fever-inducing capacities,⁸ and both at times have a toxic action on the blood or blood-forming organs. Massell⁹ and Plummer⁸ both observed cases of leukopenia, and Harvey and Janeway¹⁰ carefully studied three cases in which acute hemolytic anemia was apparently induced by these drugs. They stated that the hepatic function is depressed, as shown by the bromsulfalein test. Most authors agree that the kidney is relatively little if at all affected, but in one of our patients, to be described, suppression of urine, then albuminuria and cylindruria followed severe intoxication with sulfanilamide.

While the severe infections for which the drug was first employed may have been accessory factors in the intoxication, the warning of Reuter¹¹ concerning the probable harmful action of the drug has been amply justified in the number of severe toxic symptoms that have recently been recorded in patients with such mild diseases as simple gonococcal urethritis.¹²

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METHOD

Because rheumatic fever varies widely in duration, intensity and clinical course, the evaluation of therapeutic measures is extremely difficult, especially if they appear to be beneficial, hence in the present study we selected only patients from whom a definite answer was expected. Patients improving with simple rest and also those immediately requiring the well established therapeutic measures were eliminated, for example, patients with severe pancreatitis. In all instances therefore several days' observation was needed to make a rough estimate of the probable course of the case under investigation. Patients observed previously were especially useful, for when two or more former attacks had followed a definite pattern it seemed probable that the present illness would resemble the former ones. This occurred in some of the cases included in the present series.

The daily charting of all possible clinical manifestations, together with the therapeutic agents, is helpful, because the effect of the drug under investigation can readily be compared with that of other therapeutic measures, this is especially useful in the case of rheumatic fever, for which there are several drugs with definite and apparently beneficial effects on some of the most distressing manifestations of the disease. The precautions and measures outlined were closely adhered to during these investigations. An abstract of the course of events is given in the following report of cases, together with as much of the data as it was practical to chart.

REPORT OF CASES

CASE 1—History—P H, a woman, aged 21, admitted Dec 18 1936, on the ninth day of an indeterminate number of recurrences of a chronic type of rheumatic fever, when 7 years of age had the first definite symptoms of heart disease and when 10 the first definite polyarthritis. She had been treated six years and two years previously in this hospital for a chronic type of rheumatic polyarthritis and carditis. Mitral and aortic valves were both involved. The arthritis had usually been characterized by pain and tenderness, with a minimum of swelling and redness.

Course—Slowly increasing pain and tenderness had been present in many joints for eight days, with precordial pain for the past two days. On admission there were precordial pain and tenderness, mitral systolic, aortic systolic and diastolic murmurs, and pain and tenderness in the right shoulder, hips, knees and feet. The blood pressure was 124 systolic, 40 diastolic. During the following eight days there was an even low grade fever, but a rising pulse rate, continuous precordial pain and tenderness, additional painful and tender joints and a rising erythrocyte sedimentation rate all indicated a progressive rheumatic infection.

On the seventeenth day the administration of sulfanilamide was started 2 Gm being given for two days and then 3 Gm a dosage of 70 mg per kilogram of body weight, for four days. The only beneficial effect noted was some temporary diminution in precordial pain and tenderness. On the other hand a slight rise in temperature and a marked rise in the pulse rate took place, and additional joints became painful and tender. On the seventh day of this therapy, nausea appeared cyanosis became distinct, precordial pain was more marked and a further increase in the erythrocyte sedimentation rate was noted. Examination of the blood showed no sulfhemoglobin but some methemoglobin. The administration of sulfanilamide was stopped and aminopyrine was given with disappearance of the toxic symptoms and slow diminution in the signs of rheumatic activity.

That the rheumatic infection was not stopped was shown by continuation of the abnormal erythrocyte sedimentation rate, tachycardia and low grade fever.

No hemolytic streptococci were found in cultures of material from the nose and throat, and the antistreptolysin titer, which

was 150 units at the time of admission, never rose any higher. In this patient, therefore, there was no direct evidence of recent hemolytic streptococcus infection.

Summary—Seven days' treatment with fair sized doses of sulfanilamide apparently did not favorably affect the rheumatic process in a patient with a low grade, subacute type of infection. On the other hand, general toxic symptoms, methemoglobinemia and a marked rise in the pulse rate gave definite indications that the drug had an unfavorable action, and these signs disappeared when its administration was stopped and aminopyrine was given.

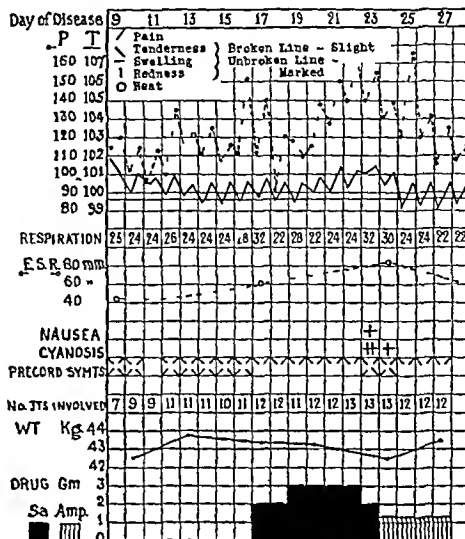


Chart 1—Course in case 1. In the charts Sa indicates sulfanilamide, Amp aminopyrine and Asp acetylsalicylic acid. Symbols used are explained at the top of this chart.

CASE 2—History—H K, a man, aged 24, was admitted Feb 15, 1937, on the twenty-fifth day of the fifth definite attack of rheumatic fever. All of the attacks had been characterized by chronicity, marked and persistent erythema marginatum and subcutaneous nodules. In the first attack, at the age of 7, there were, in addition, chorea, carditis and pleurisy. In subsequent relapses the fever had been rather low grade and the arthritis mild but persistent. There had been a progressive increase of cardiac involvement, so that the aortic valve was very incompetent there was also a loud mitral systolic murmur.

Course—Beginning on January 22, there was a three day attack of "grip". A period of latency of thirteen days followed, and then pain appeared in the calf muscles, followed two days later by mild arthritis in the knees and ankles, which spread to the elbows and shoulders and was accompanied by a fever as high as 103 F. On admission the cardiac murmurs were the same as had been noted previously, the blood pressure was 130 systolic 50 diastolic. The arthritis was limited to the left arm, and there was beginning erythema marginatum. During the next ten days the fever ranged mostly between 100 and 102.5 F, but the pulse rate was relatively slow. The erythema marginatum became intense, but the arthritic lesions were relatively mild. The erythrocyte sedimentation rate continued at about 112 mm per hour, and low grade leukocytosis persisted.

As the course resembled so closely the pattern previously observed, the case seemed ideal for a trial of sulfanilamide, so on the thirty-fifth day, the administration of this drug was started, and it was continued for six days in doses of 4 Gm (62 mg per kilogram of body weight). There was a definite though moderate increase in both fever and pulse rate, together with a 'dopey feeling' but, with the exception of a fall in weight the toxic symptoms shown by the other patients were lacking. The rheumatic manifestations continued, with an increase in the number of joints involved and many new cutaneous lesions. When administration of the drug was stopped there was a fall in temperature and the patient felt better. After a drug-free interval of five days, aminopyrine

was given, with a prompt fall in the temperature and pulse rate and marked amelioration of most of the symptoms. On the fiftieth day, however, a crop of subcutaneous nodules appeared, and new ones were observed for the following two weeks. Thus the picture previously observed was completed, and the patient was not discharged until 140 days after the onset of his illness.

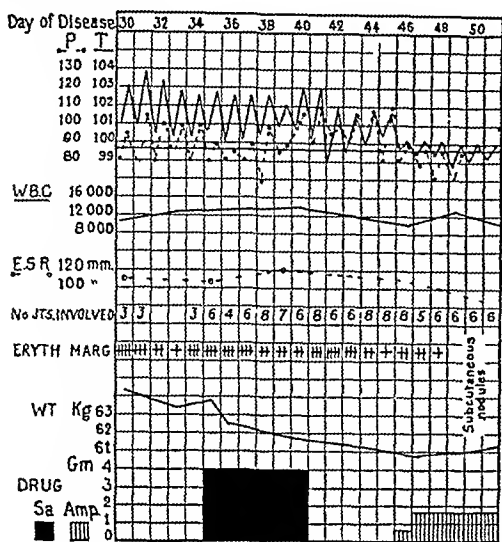


Chart 2—Course in case 2

Although no hemolytic streptococci were recovered from this patient the antistreptolysin titer in the serum rose from 300 units at the time of admission to 500 units ten days later and 600 units by the fiftieth day, when the subcutaneous nodules appeared. The concentration of these antibodies remained at this high level for about two months, then fell slowly. It thus seems probable that hemolytic streptococci had recently been active but that sulfanilamide had no effect on the continued production of antistreptolysin.

Summary—In a patient who had shown a remarkable constant type of rheumatic fever during four previous attacks, with erythema marginatum and subcutaneous nodules as prominent features, sulfanilamide, in what would be considered adequate dosage, had no beneficial effect on the usual course of events. On the other hand, it seemed to have a pyrogenic and pulse-accelerating influence, in spite of the absence of most of the other usual signs of sulfanilamide intoxication.

CASE 3—History—C. C., a girl, aged 10, was admitted Dec 3, 1936, on the twenty-third day of her second attack of rheumatic fever. At the age of 3 she had acute arthritis, involving both legs, for two weeks; no mention was made of cardiac disease at that time.

Course—November 11 the patient had sore throat and headache lasting one day. She was well for six days, and on the eighth day arthritis of the knees appeared, followed by migratory polyarthritis in both legs and arms. Two days before admission, the twenty-first day of the disease, she received her first medical attention, she then had fever and polyarthritis which were relieved by some medicine. On admission the temperature was 101° F and the pulse rate 120. A mitral systolic murmur was present, and the arthritis was limited to the joints of the right arm and hand. During the next two days the temperature and the pulse rate were high and numerous new joints were involved, hence she was given sulfanilamide first in doses of 1.2 Gm daily for two days, i.e., 50 mg per kilogram of body weight. The fever and pulse rate became higher, and precordial pain and tenderness and a pericardial rub appeared. The dose was increased to 2 Gm (80 mg per kilogram of body weight), and, while the arthritis diminished in some joints, others were involved. Precordial pain and tenderness were more marked, and the pericardial rub was heard over a larger area. The pulse rate rose to 150 and the respiratory rate to 40. There were almost complete anorexia, with nausea and vomiting and an increase in leukocytosis.

By the twenty-eighth day (the fourth day of sulfanilamide medication) the condition was such that aminopyrine seemed urgently indicated. One gram of this drug induced a marked fall in temperature and relief of the polyarthritis, but the anorexia, nausea and vomiting continued through the following day. The precordial and abdominal pains were slower in responding, and the rapid pulse and respiratory rates continued probably because of the pericarditis, for roentgenograms revealed distinct cardiac dilatation.

Twelve days after the beginning of sulfanilamide therapy a crop of subacute rheumatic nodules appeared, and new ones were noted for the next week; macroscopic nodules persisted for a month.

On the eighty-fourth day, moderate fever, polyarthritis, cardiac dilatation and pleurisy reappeared, but they were relieved promptly by increasing the dose of aminopyrine from 12 to 18 Gm. Tonsillectomy was performed on the one hundred and sixteenth day. The patient was discharged on the hundred and forty-second day. The heart was distinctly larger than on admission, no new murmurs were present but a musical mitral systolic murmur continued, and there were probably some pericardial adhesions.

No hemolytic streptococci were recovered from cultures of material from the throat made shortly after admission or from the tonsils removed on the one hundred and sixteenth day. The antistreptolysin titer in the serum obtained on the twenty-third day was 700 units, where it remained during the next two months, it then slowly decreased but was still 300 units six

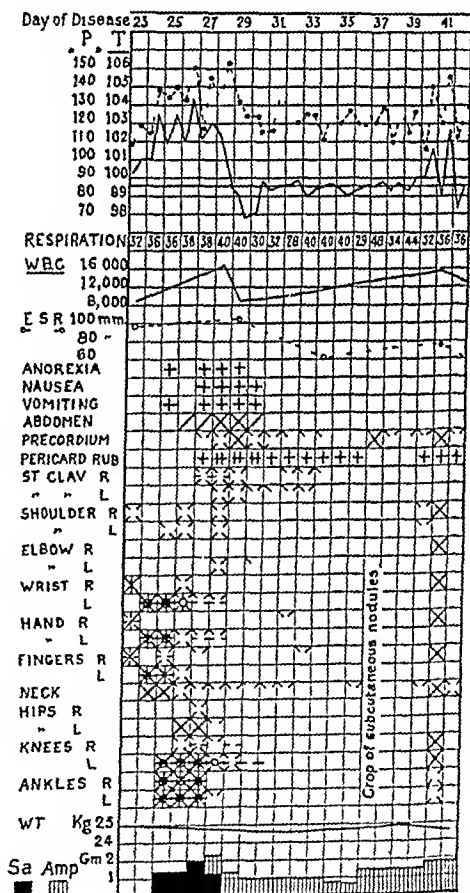


Chart 3—Course in case 3

months after the onset of the disease. This is presumptive evidence of recent hemolytic streptococcus infection.

Summary—Although receiving sulfanilamide in relatively large doses and to the limit of tolerance, the patient continued to show increasing acute signs of arthritis and pericarditis. Furthermore the subsequent appearance of subcutaneous rheumatic nodules proved that in this patient the drug did not inhibit the development of the proliferative manifestations of the rheumatic infection.

CASE 4—History—S J, a boy, aged 13, admitted May 20, 1937, on the eleventh day of the fourth attack of rheumatic fever, had his first attack of the disease at the age of 9 and two or three relapses subsequently.

Course—May 10 the patient had a cold in the head and marked coryza. On the eighth day there were fever and arthritis, which began in the right knee and left ankle. Two

days later, while still at home, the patient received 0.66 Gm of sulfanilamide, and he received 0.33 Gm the day of admission. On admission, May 20, the temperature was 104 F, the pulse rate 120, and the respiratory rate 38. There were arthritis of the right knee gallop rhythm and mitral systolic and aortic diastolic murmurs. Two days later the arthritis had regressed from the right knee but had migrated to the left knee and the toes of the left foot. The fever continued. As the two day control period indicated a spreading rheumatic process, the administration of sulfanilamide was started in doses of 4 Gm a day, the equivalent of 54 mg per kilogram of body weight.

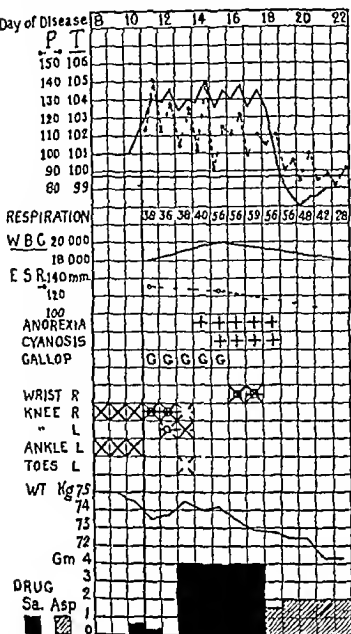


Chart 4—Course in case 4

The general course is indicated on chart 4. While the arthritis, present at the beginning of medication, disappeared, the fever and rapid pulse rate continued, the respirations became very rapid, cyanosis increased and anorexia became marked. Arthritis of the right wrist appeared and increased. In fact, the general aspect of the patient indicated need for definite antirheumatic medication, so aminopyrine was given, with the usual spectacular improvement, which continued uninterrupted. The loss in weight could be attributed both to an antiobesity diet and to almost complete anorexia.

That the patient was satisfactorily absorbing sulfanilamide was proved by the results of blood analysis on the third day of this therapy, when the total concentration of sulfanilamide was 74 mg per hundred cubic centimeters and the concentration of the nonconjugated form 57 mg.¹² Two days later the total was 825 mg, of which 69 mg was nonconjugated, and thirty six hours after administration of the drug was stopped the total concentration was 1.67 mg, of which 0.9 mg was nonconjugated. Thus the conjugated sulfanilamide on the three dates was 23, 16 and 46 per cent, respectively.

The antistreptolysin concentration in the blood serum, which was 1,600 units on admission, dropped to 1,000 and then went to 1,200 units, where it remained for over two months.

Summary—In the fourth definite attack of rheumatic polyarthritis, a boy of 13, with probable involvement of the mitral valve and definite involvement of the aortic valve, received 4 Gm of sulfanilamide daily for five days a total of 20 Gm which produced a concentration of at least 8 mg per hundred cubic centimeters in the blood. While arthritis present at the beginning disappeared, new joints became involved and a continued high fever and pulse rate, a mounting respiratory rate, cyanosis, nausea and increasing toxicity, with continuing marked leukocytosis all pointed to little beneficial effect compared with what would have been expected early in an acute streptococcal infection. The contrast with the rapid anti-symptomatic influence of aminopyrine was most striking.

CASE 5—History—F P, a man, aged 20, was admitted May 24, 1937, on the fifth day of an acute attack of rheumatic fever. This was at least the sixth recurrence of the disease in a patient in whom, at the age of 11, the first manifestation was chorea. He had been treated in this hospital at various times for chorea, polyarthritis and carditis, and during this period both mitral and aortic valvular disease had developed.

Course—No symptoms or preliminary infection of the upper respiratory tract were present. Four days prior to admission the patient had severe epistaxis, weakness, fever, migratory polyarthritis and persistent precordial pain. These symptoms were much relieved by self medication with 2 Gm daily doses of aminopyrine, taken for the past two days. On admission the temperature was 101 F and the pulse rate 100. The only complaint was pain and tenderness of the right knee. Apical systolic and aortic diastolic murmurs were present. The blood pressure was 135 systolic, 50 diastolic. During the next four days the temperature rose to 103 F but the pulse remained relatively slow. On the eighth day anorexia and vomiting were present on two occasions. On the ninth day, because of recurring polyarthritis, the administration of sulfanilamide was started 4 Gm daily, i.e., 50 mg per kilogram of body weight, was given. Cyanosis appeared and the anorexia continued. On the tenth day, with the same dose, the fever was higher, the pulse rate more rapid and the cyanosis more marked and there were complete anorexia and more arthritis. On the following day the patient appeared much sicker, and, although fewer joints were involved, the right wrist was more markedly inflamed and the fingers of the left hand were painful and tender. Dyspnea and cyanosis were marked. The appearance of gallop rhythm indicated more marked cardiac involvement. After the third day of sulfanilamide the patient's condition

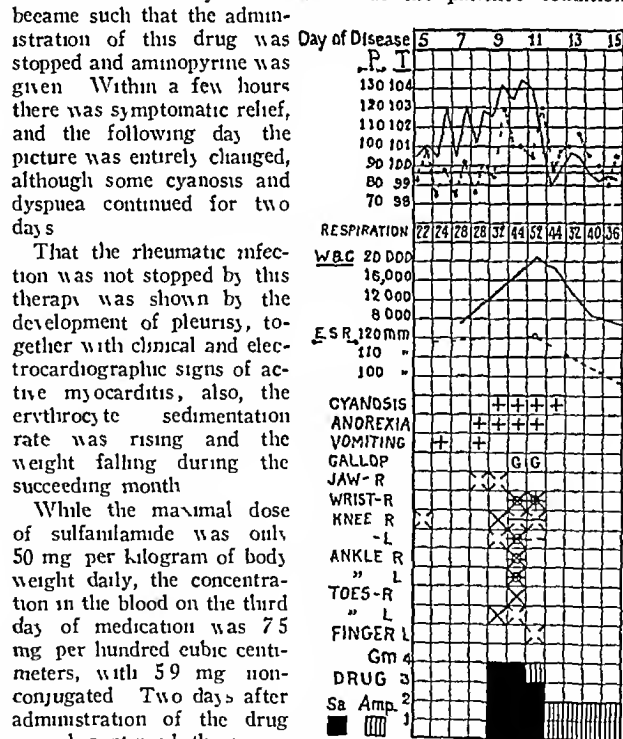


Chart 5—Course in case 5

became such that the administration of this drug was stopped and aminopyrine was given. Within a few hours there was symptomatic relief, and the following day the picture was entirely changed, although some cyanosis and dyspnea continued for two days.

That the rheumatic infection was not stopped by this therapy was shown by the development of pleurisy, together with clinical and electrocardiographic signs of active myocarditis, also, the erythrocyte sedimentation rate was rising and the weight falling during the succeeding month.

While the maximal dose of sulfanilamide was only 50 mg per kilogram of body weight daily, the concentration in the blood on the third day of medication was 75 mg per hundred cubic centimeters, with 59 mg nonconjugated. Two days after administration of the drug was discontinued there was still a total of 15 mg, with 1 mg nonconjugated. The blood taken at the time of the most marked cyanosis showed no sulfhemoglobin.¹³ No hemolytic streptococci were recovered from cultures of material from the nose and throat. The antistreptolysin titer in the blood serum was slightly more than 150 units at the time of admission and rose ten days later to 250 units, where it remained two weeks, then fell slowly. This is presumptive evidence of recent hemolytic streptococcus infection.

¹³ Dr G I Lavin performed these tests.

¹² Sulfanilamide estimations were made according to the method of F K Marshall Jr. (Determination of Sulfanilamide in Blood and Urine) *Proc Soc Exper Biol & Med* 36:422 (April) 1937.

Summary—No antirheumatic influence was exerted by sulfanilamide when given in moderate doses to a patient during the second week of a severe relapse. Even this moderate dosage induced toxic symptoms so severe that discontinuance of the medication was indicated on the third day. The contrast with the effect of aminopyrine, exhibited on two occasions, was

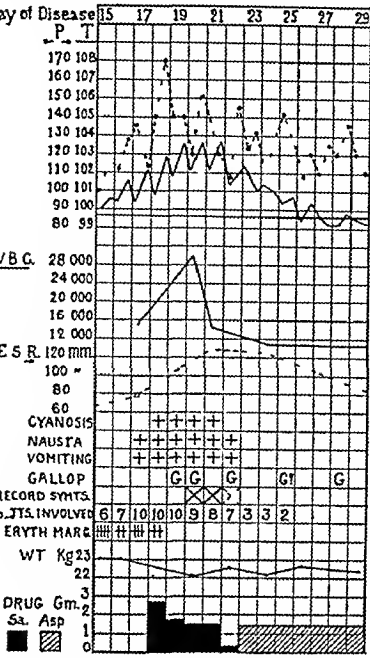


Chart 6—Course in case 6

day showed 10 per cent matt colonies of hemolytic streptococci. Erythema marginatum appeared on the fourteenth day.

Course—The patient when admitted had a temperature of 100 F, a pulse rate of 100, extensive erythema marginatum and pain and tenderness, but no swelling or redness of the shoulders, elbows and knees. A blowing apical systolic murmur was present. About 5 per cent of the colonies in a culture of material from the throat were hemolytic streptococci. During the next three days there were mounting fever and pulse rate, spreading arthritis, diminishing erythema and a rising erythrocyte sedimentation rate. Although hemolytic streptococci persisted in cultures of material from the throat, the colonies were fewer.

Because of increasing symptoms, sulfanilamide therapy was instituted on the eighteenth day. 2.6 Gm was given, i.e., 113 mg per kilogram of body weight, in order to obtain rapid saturation. Cyanosis appeared by evening, previously existing nausea and vomiting continued. The next day the dose was dropped to 1.6 Gm and the two following days to 1.3 Gm each day. The fever increased and the pulse rate became very rapid, polyarthritis consisting of pain and tenderness continued and precordial pain and tenderness appeared. Cyanosis, nausea and vomiting became more marked, leukocytosis continued and the erythrocyte sedimentation rate rose from 80 to 130 mm per hour.

Because of the absence of beneficial effect, all medication was stopped on the twenty-second day and acetylsalicylic acid therapy was started the twenty-third day with steady improvement. The systolic murmur assumed a musical character which persisted until about the forty-eighth day when it diminished in intensity, but a loud aortic diastolic murmur appeared and has persisted.

Hemolytic streptococci were not found in cultures of material from the throat after the second day of sulfanilamide treatment. The total concentration of sulfanilamide in the blood serum on the evening of the second day of drug therapy was 6 mg per hundred cubic centimeters, with 515 mg nonconjugated. Two days after the administration of this drug was discontinued there was still a total of 1 mg of sulfanilamide per hundred cubic centimeters, with 0.83 mg nonconjugated.

Summary—There was little diminution in the arthritis but an increase in the cardiac symptoms, leukocytosis and erythrocyte sedimentation rate, together with increasing toxicity in a child with a first attack of rheumatic fever who was given all the sulfanilamide she could retain by mouth and who evidently absorbed most of it into the blood stream. The only beneficial effect noted was disappearance of erythema marginatum. That the cardiac involvement was not arrested was shown by the appearance of definite aortic regurgitation one month later. The effect on the streptococcal flora in the throat was indeterminate, because the number of colonies was diminishing before sulfanilamide was given.

CASE 7—History—C K, a boy, aged 15, admitted May 10, 1937, on the ninth day of a definite recurrence of rheumatism had had many attacks of sore throat earlier in life but fewer in the past four years. At the age of 7 a tonsillectomy was performed, and three months later the first joint pains were noted. He spent six months in another hospital, where he was told he had heart disease. He was at home eight months out of bed a few weeks and then in the hospital five and a half months. He was well for nine months then in bed almost continuously for nine months. In the spring of 1936 he was again treated for arthritis in another hospital for three months and at home for two months. Each attack of acute arthritis was relieved with aminopyrine. He stated that in the past seven years there was never a week without joint pains, but that in the past eight months he had been much better, especially during the last four months. He had been told repeatedly that he had heart disease, but he had had no symptoms of congestive failure.

Course—May 2 the patient had a sore throat, with slight fever. He then had no symptoms until May 7, when fever appeared. The cervical lymph nodes were tender and swollen and there was definite arthritis of the knees with pain in the upper extremities. Self medication with 2 Gm of aminopyrine on the seventh and eighth days gave almost complete relief from arthritic pain, but the swelling in the left knee continued.

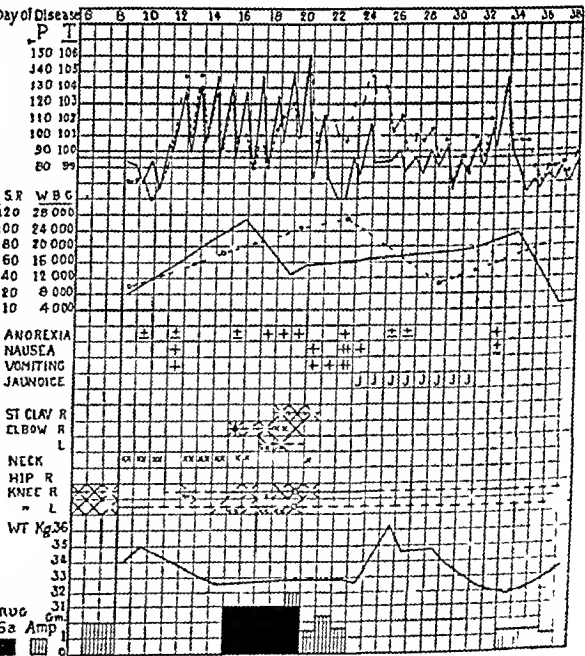


Chart 7—Course in case 7

On admission the temperature and the pulse were normal. The patient did not look acutely ill, although he had a yellow color. The heart was normal in size with only a slight apical systolic murmur. The spleen was moderately enlarged. The neck was stiff and a roentgenogram showed fusion of the laminae of the third, fourth and fifth cervical vertebrae. The fingers were slightly spindle shaped with overextension of the first interphalangeal joint and flexion of the distal interphalangeal joint.

phalangeal joints. Marked effusion was present in the left knee. As the influence of the aminopyrine wore off, there appeared a septic fever, rapid pulse rate and recurring arthritis of the knees, characterized by marked effusion but relatively little pain and tenderness. An increase in the leukocytosis and the erythrocyte sedimentation rate and migratory polyarthritis gave evidence by the sixteenth day of progressive rheumatic infection. Whether the condition was true rheumatic fever or an acute phase of chronic rheumatoid arthritis was not definite, but some features favored the latter.

On the sixteenth day the administration of sulfanilamide was started, 3 Gm daily, or 94 mg per kilogram of body weight, being given. This dose was given for five days with no beneficial effects, on the contrary, the clinical picture showed a rising pulse rate, a still higher erythrocyte sedimentation rate, persisting leukocytosis and involvement of new joints without any disappearance of the inflammation in those previously involved. Because of the discomfort and the history of beneficial effects of aminopyrine, 1 Gm of this drug was given on the twentieth day, with the usual favorable influence

Sulfanilamide Content of the Blood in Case 7

Day of Disease	Day of Sulfanilamide	Total Mg per 100 Cc	Nonconjugated Mg per 100 Cc	Conjugated Mg per 100 Cc	Conjugated Percentage
18th	3d	8.3*	6.5	1.8	22
23th	5th (stopped)	8.2	5.5	2.7	32
23th		3.8*	1.1	2.7	71
24th		3.3	1.1	2.2	66
26th		1.0	0.3	0.7	70
27th		0.3	0.2	0.1	33

* Serum analyzed

on the arthritis and the temperature. This drug was given three days more, but during this period toxic symptoms noted at the end of the sulfanilamide therapy, increased so that finally the patient was constantly nauseated and unable to retain any food or fluids given by mouth. There was also complete suppression of urine for forty-eight hours. Fluids were supplied by hypodermoclysis, intravenous infusion of dextrose and proctoclysis, and this treatment was accompanied by diminution in nausea and vomiting, with renewed ability to take nourishment by mouth. On the twenty-fourth day of the disease a generalized morbilliform rash appeared for only a few hours, icterus was noted, which became more marked, then slowly diminished and finally disappeared after being present a week.

On the twenty-fourth day the patient appeared very anemic, and a blood count showed 2,400,000 erythrocytes and 51 per cent hemoglobin. The icteric index was 25, with the serum bilirubin 2.5 per cent. An extremely high content of blood pigment and the presence of urobilin in the urine suggested some hepatic damage. Then edema appeared in the face and legs, and there was a rapid increase of over 3 Kg, about 10 per cent, in body weight. As the jaundice disappeared the fever recurred, with an increase of effusion in the right knee. Hence aminopyrine was again given, with the customary clinical improvement. This time, however, the exhibition of this drug was followed by a drop in leukocytes to 4,600, with only 30 per cent of granulocytes, so it was discontinued, with a fairly rapid return of the leukocytes toward normal. Clinical improvement continued. The anemia diminished, and the only untoward sign that appeared was hematuria, first macroscopic and then microscopic. The urea clearance on the forty-eighth day was normal, and urine concentration tests showed normal ability to concentrate. The results of several analyses of whole blood or serum for the content of sulfanilamide are shown in the accompanying table.

While the patient was taking the drug in as large doses as he could tolerate, the concentration in the blood was over 8 mg per hundred cubic centimeters. More interesting still was the retention of unusually large amounts for several days after it was no longer given and during this period the conjugated form was about 70 per cent. The anuria and the subsequent low renal capacity doubtless caused the slow excretion.

Although no hemolytic streptococci were recovered from this patient, the antistreptolysin titer indicated that these micro-

organisms were probably active. On admission the titer in the serum was only 50 units, six days later, just before the administration of sulfanilamide was started, it was 700 units, two weeks later it had risen to 3,000 units, and it remained at 2,400 units for over two months. Obviously, in this patient the drug did not inhibit the formation of large amounts of this antibody.

Summary—Although the type of rheumatism could not be definitely determined, it was acute and followed a definite severe angina. The high antistreptolysin curve indicated a recent hemolytic streptococcus infection. Five days of intensive sulfanilamide therapy was accompanied by an increase in the arthritis and induced severe intoxication, with renal and hepatic damage, and anemia, with acute hemolytic jaundice, from which the patient recovered. The contrast between the lack of therapeutic effect and the marked drug intoxication was especially noteworthy.

CASE 8—History—J. R., a boy, aged 13, admitted March 16, 1937, a week after the onset of his present illness, was said to have had rheumatism annually since 1931. On admission there were signs of consolidation in the left lower lobe, slight cardiac enlargement, mitral systolic and aortic diastolic murmurs, pains in the knees and shoulders, erythema marginatum, albuminuria and hematuria. A few colonies of group A hemolytic streptococci were recovered from cultures of material from the throat.

Course—During the succeeding two months there were alternating periods of activity and a tendency toward improvement. May 29 a tonsillectomy and adenoidectomy were performed. Group B hemolytic streptococci were isolated from the tonsils. After the operation there was a flare-up in the rheumatic activity. During August a granulomatous area in the nasopharynx was found, and from it group A hemolytic streptococci were repeatedly cultured. There was also evidence of ethmoiditis. With the patient taking daily doses of 1.8 Gm of acetylsalicylic acid the temperature ranged between 98 and 100 F and the pulse rate between 80 and 110. September 24, the two hundredth day of the present attack, 2 Gm of sulfanilamide was given and the following day 3.3 Gm. An elevation of temperature to 102.6 F followed, with a pulse rate of 148, marked nausea and anorexia and a remarkable increase in the erythema marginatum. Because these symptoms of toxicity persisted on the third day of medication only 0.6 Gm. was given. Toxic symptoms persisted for twenty-four hours, then disappeared. This episode was followed by disappearance of the hemolytic streptococci from the nasal cultures, disappearance of the erythema marginatum and some improvement for about three weeks. Then another cycle of rheumatic activity appeared.

Summary—Six grams of sulfanilamide given during three days to a boy with chronic rheumatic fever induced fever, tachycardia, nausea and anorexia, marked general depression and a remarkable increase in erythema marginatum. That these effects were due to the action of the drug was proved by their disappearance when it was withdrawn.

COMMENT

Although only a few cases were studied, if each is considered as a single valid test there are enough to establish the fact that, under the conditions of these observations, sulfanilamide has little, if any, detectable beneficial effect on the course of rheumatic fever, once the condition is well established. Practically all its common manifestations except chorea were represented in this group, and none responded favorably. On the other hand, the toxic effects of the drug were especially marked in these patients, and as a result certain rheumatic manifestations seemed to be intensified.

The criticism might be advanced that the ineffectiveness of sulfanilamide here recorded was due either to insufficient daily dosage or to relatively short periods of administration. In answer it must be noted that all patients except patient 2 received the drug until gastric symptoms made it impractical to administer more. In five there was marked and in two others moderate

cyanosis, and in most there was a distinct increase in respiratory rate, which might be attributed either directly to the drug or to an intensification of the disease.

Other toxic symptoms apparently directly attributable to the drug were increasing fever and pulse rate. Thrice these decreased shortly after administration of the drug was stopped, and a fever of 102.6 F in case 8 the day following the first doses of sulfanilamide left little doubt that the drug was a definite pyrogenic factor. In other cases urgent symptoms indicated the use of aminopyrine, therefore, the fever-inducing role of sulfanilamide could not be so well determined. It seems highly probable, however, that the drug helped to increase the fever in all instances. Moreover, Long and Bliss¹⁴ observed that fever was the most common toxic symptom induced by sulfanilamide. The time relationship between the beginning of drug treatment and the onset of fever differed from the delayed reaction reported by Hageman and Blake,¹⁵ in our cases the onset was immediate. This feature alone might be sufficient contraindication for using sulfanilamide in the presence of rheumatic fever, for hyperpyrexia is a very serious manifestation of this disease, it is necessary to guard constantly against any factor that might induce an elevation of temperature, because this symptom of itself could determine a fatal outcome.

The accelerated pulse rate might have been due to one or more of several influences: (a) a direct toxic action of the drug on the heart, (b) acidosis and the condition of the blood that was manifest as cyanosis, (c) added fever, though in several instances the acceleration of the pulse was out of proportion to the increased temperature, and (d) an actual increase in the rheumatic infection. In any event, a markedly accelerated heart rate is a distinctly undesirable influence in any therapeutic measure applied to rheumatic fever, for with this acceleration there is a proportional increase in the functional trauma to which the cardiac valves and the myocardium are subjected while in an inflamed condition, and, even though the outcome is eventual recovery, the amount of residual scarring is probably increased.

Most drugs have toxic capacities that must be considered in relationship to their therapeutic effects, and if the latter outweigh the former the drugs are considered satisfactory. This seems to be the case with the sulfanilamide treatment of serious acute hemolytic streptococcus infections as well as of infections induced by meningococci¹⁶ and gonococci¹⁰. It is therefore necessary to investigate carefully the influence of this drug on all the manifestations of rheumatic fever that can be closely observed. The difficulty of accurately estimating its influence on the febrile course has been discussed. Its effect on arthritis appears more easily determinable, even though some of the signs are entirely subjective, as was the case in three of our patients in whom pain and tenderness persisted and possibly became more troublesome. In four other patients, however, there were definite objective signs of migration to formerly symptomless joints, even though some joints improved that were previously involved. In other words the arthritis behaved much as would have been expected had the patients received no treatment.

Erythema marginatum is one of the characteristic signs of continuing rheumatic intoxication. In one patient (patient 6) it disappeared even though other signs of the disease persisted, in a second (patient 2), in whom erythema marginatum had always been an outstanding feature, many new lesions appeared daily during the six days of sulfanilamide therapy, and in a third (patient 8) it was much aggravated. In patient 2 subcutaneous nodules also developed within a fortnight of the time he was fully under the influence of this drug, and the same phenomenon was observed in patient 3. Sulfanilamide therefore exerted no appreciable therapeutic effect on the immediate acute exudative manifestations or any prophylactic influence on the more remote proliferative features that could be accurately observed.

While the effect on the visceral lesions was more difficult to determine, pericarditis developed in patient 3 while she was taking sulfanilamide, and in several there was evidence of myocardial involvement either while they were taking the drug or shortly thereafter. This evidence, in conjunction with the well known tendency of rheumatic myocarditis to develop simultaneously with subcutaneous nodules, makes it highly probable that the cardiac manifestations were not favorably influenced by sulfanilamide.

The leukocyte curve and the erythrocyte sedimentation rate are considered useful objective criteria of the course of rheumatic infection. There was an increase in leukocytosis in all seven patients in whom this feature was accurately measured, in five the count rose to 20,000 or more, and in the two others to 13,000 and 16,000, respectively. Sulfanilamide, likewise, seemed to exert no favorable influence on the erythrocyte sedimentation rate. In one patient a measurement of 125 mm per hour remained practically the same, in another the rate increased from 115 to 120 mm, and in the others the rise from previous abnormal levels was 10, 15, 20, 30 and 50 mm, respectively. In only one did a falling curve continue downward. While a fall in so short a period might not have been expected or considered clear evidence of therapeutic failure of the drug, the almost consistent increase in rate pointed definitely to such a failure.

Theoretically, the question might be raised as to whether the lack of beneficial effect of sulfanilamide in these patients indicated that the hemolytic streptococcus had no influence in causing their rheumatic state. On the other hand, it is possible that, once this state is established, the drug will have no antirheumatic action, even though it may eliminate the streptococci. It is therefore essential to present the evidence that hemolytic streptococcus infection was present in these subjects, both before and after treatment. This evidence was the isolation of such cocci and the presence of antihemolysins—so-called antistreptolysins—in the blood serum.

In only two patients were hemolytic streptococci recovered from cultures of material from the nose and throat. In explanation may be advanced the argument that no patient was seen at the time of onset of the upper respiratory infection, which was definitely present in six of the eight, and that hemolytic streptococci which might have been present at the onset, could easily have disappeared from the throat in the interval.

The antistreptolysin¹⁷ curves for six of the eight patients were indicative of fairly recent infection with

14 Long P H and Bliss Eleanor A Para Aminobenzenesulfonamide and Its Derivative Arch Surg 34 351 (Feb.) 1937

15 Hageman P O and Blake F G A Specific Febrile Reaction to Sulfanilamide J A M A 109 642 (Aug 24) 1937

16 Schwentker F F Gelman Sidney and Long P H The Treatment of Meningococcal Meningitis with Sulfanilamide J A M A 105 1-07 (April 24) 1937

17 Todd E W Antihemolysin Titres in Hemolytic Streptococcal Infections and Their Significance in Rheumatic Fever 1st J Exp Path 13 2-8 (June) 1932

these micro-organisms. The two other curves, showing titers of only 100 to 150 units, might be considered as equivocal evidence, however, the repeated isolation of hemolytic streptococci from the nasopharynx of one of the patients pointed to a focal infection with these bacteria. Of the six with significant antibody titers, two (5 and 6) had curves quickly rising to 250 units from an earlier level of 150, and in one of these the titer eventually reached 350. Patient 2 in the fourth week had a titer of 350 units, which later doubled in strength. A fifth, patient 3, maintained a level of 700 units from the fourth week to the third month. Patient 4 showed 1,600 units in the second week, from 1,000 to 1,200 units during the next four weeks and a slowly falling curve thereafter. For the final patient (7) the curve rose rapidly from 50 units on the ninth day to 700 on the fifteenth and to about 3,000 on the twenty-ninth and then varied between this level and 2,500 for many weeks. This was the patient who suffered the severe sulfanilamide intoxication.

Sulfanilamide therapy had no uniform effect on the antistreptolysin curve. The relation of the titers with respect to exhibition of the drug was as follows. In three patients the titer remained level at 100, 150 and 700 units, respectively, in one it remained level at 500 units and two weeks later rose to 600, in one it rose from about 175 to 250 units and in another from 150 to 350, in patient 7 it rose from 700 to 2,400 units during treatment with the drug and a week later to almost 3,000 units. In only one patient (4) was there a fall during sulfanilamide therapy, the titer dropped from 1,600 to 1,000 units and subsequently rose to 1,200. As the range in curves is about what might have been expected in an untreated group of patients with rheumatic fever of comparable severity, there is little evidence that the formation of antistreptolysin was influenced in any way by the drug. On the other hand, there was strong presumptive evidence that at least six of the patients were responding normally with formation of antibody to recent infection with hemolytic streptococci.

That significant amounts of this antibody should have developed prior to their receiving sulfanilamide is not surprising, because the stimulus to the formation of antistreptolysin doubtless was active from two to four weeks before the therapy was instituted. However, the prolonged, and in some cases rising, antibody curves following the use of such an antistreptococcal agent is of theoretical interest for the following reasons. It seems probable that the course of the antistreptolysin curve might give some indication of the possible elimination—or lack of elimination—of the streptococci as a result of the sulfanilamide therapy, for Todd¹⁸ has found that the titer in the serum of animals falls rapidly as soon as the injection of the antigen is discontinued, and Coburn¹⁹ recorded that guinea pigs maintain high titers when carrying foci of infection. The lack of a definite fall in the antibody curve within a few weeks of sulfanilamide treatment is therefore presumptive evidence of continued production of streptolysin. This evidence is in line with our observation of several other patients, suffering from simple tonsillitis in whose serum fairly high antistreptolysin titers developed in spite of their receiving sulfanilamide early in the course of the infection.

Knowledge of the mechanism whereby streptococci may induce the manifestations of rheumatic fever in many, if not all, instances is distinctly theoretical. The hypothesis guiding our general investigations may be formulated as follows. The primary hemolytic streptococcus infection is followed quickly by a state of antitoxic immunity, in contrast to a relatively delayed type-specific antibacterial immunity,²⁰ and a state of bacterial hypersensitivity (hyperergy to streptococci) is concomitantly induced. With the development of partial immunity, the persisting streptococci are reduced to a state of relative avirulence for the individual but continue to be active in the tonsils, lymph nodes, sinuses and other tissues, where they set up focal infections, which are ideal sites for the further, continuous stimulation of a hypersensitive state of the entire body. Moreover, the persistence of streptococci in these foci results in the elaboration of poisonous substances, either from the bacterial bodies or from the patient's tissues, or from both, which irritate and damage certain portions of the hypersensitive mesenchymal system. Assuming that this mechanism accounts, in part, for the damage inflicted on the rheumatic patient's tissues, it is possible that the injury could be stopped either by lowering the hypersensitivity of the tissues or by removing completely the streptococci from the foci.

That the hypersensitive state of some of the tissues was not lowered is shown by the persistence of marked cutaneous reactivity to intradermal injection of hemolytic streptococcus extract in several of the patients. Moreover, in studying the action of sulfanilamide in guinea pigs infected with hemolytic streptococci, we²¹ found that neither in vivo nor in vitro was it possible to demonstrate any distinct diminution in the hypersensitivity of the tissues of animals taking large doses of the drug.

It seems therefore that the only effect which might be expected from this antistreptococcus agent in a rheumatic patient infected with hemolytic streptococci is a diminution in the amount of poisonous substances that might be flowing out of infected foci because most of the bacteria acting in them had been killed. Colebrook and his co-workers,²² however, have observed that prontosis-treated patients who have recovered from puerperal fever continue to discharge streptococci in the lochia for long periods. We have grown hemolytic streptococci from material from the throats of some sulfanilamide-treated patients for several weeks after they had recovered from tonsillitis, and Longcope²³ has recovered similar micro-organisms from excised tonsils of patients who had received large amounts of the drug. Several observers have reported the persistence of latent foci of hemolytic streptococci in mice treated with large doses of prontosis or sulfanilamide.²⁴ With such evidence available, it would be surprising if all streptococci were eliminated from the deep-seated foci in our rheumatic patients, who could tolerate only relatively moderate amounts of sulfanilamide, hence it seems highly probable that bacterial toxic substances continued to be elaborated and thrown off from infected foci.

20 Swift H F and Hodge B E. Type Specific Anti M Precipitins in Rheumatic and Non Rheumatic Patients with Hemolytic Streptococcal Infections. *Proc Soc Exper Biol & Med* 34 849 (June) 1936.

21 Swift H F and Moen J K. Unpublished observation.
22 Colebrook Leonard Kenny Merv and others. Treatment of Human Puerperal Infections and of Experimental Infections in Mice with Prontosil. *Lancet* 1 1279 (June 6) 1936.

23 Longcope W T. Per oral communication to the authors.
24 Long I H and Bliss E A. Para Amino-Benzene Sulfonamide and Its Derivatives. *J A M A* 108 32 (Jan 2) 1937. Colebrook and his associates.

18 Todd E W. Per oral communication to the authors.
19 (a) Coburn A F. Per oral communication to the authors. (b) Observations on the Mechanism of Rheumatic Fever. *Lancet* 2 1025 (Oct 31) 1936.

For the foregoing reasons it is obvious that the therapeutic results in this series of patients do not shed much new light on the possible relationship of hemolytic streptococcus infections to rheumatic fever. Nevertheless, these investigations clearly demonstrate that sulfanilamide, when given in as large doses as can be tolerated after the onset of rheumatic fever, exercises little, if any, ameliorating influence on the course of the rheumatism. Moreover, because the toxic by-effects seem to be specially marked in patients with this infection, the drug may have a deleterious influence on the course of the disease. The prophylactic action of sulfanilamide in rheumatic subjects infected with hemolytic streptococci is still to be determined.

CONCLUSION

The toxic action of sulfanilamide in active rheumatic fever so far outweighs the beneficial therapeutic effect that its administration to patients with this disease does not seem justified.

RECENT ADVANCES IN ANESTHESIA

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Recent advances in anesthesia have increased the surgeon's range of choice of anesthetic for most operations, but especially for operations in the upper part of the abdomen, such as those performed on the gallbladder and its ducts and on the stomach. When the results from anesthetics given by commonly used inhalation methods are satisfactory, there is no good reason for administering these substances otherwise. However, when there seems to be any respiratory obstruction, dyspnea or heaving abdominal movements, quiet respiration and adequate and easy control of administration of the anesthetic can be brought about by the use of a large bore, soft rubber intratracheal (Magill's) tube.¹ In more than 50 per cent of cases this tube can be inserted through the nostril and into the trachea without the necessity of opening the patient's mouth or, by use of the laryngoscope, the tube can be placed under direct vision. When the tube is in place it can be attached to the gas machine and anesthesia can be carried out smoothly, on an even plane, for an indefinite period. With the anesthetist thus removed from the field of operation, and the maximum of room made available to the surgeon, especially in operations on the face, head and neck, operation is facilitated and bleeding is minimized because of quiet respiration and the fact that the assistant, as well as the surgeon, can approach the field easily. When it is unnecessary to connect the tube to the machine, it is left protruding an inch or so from the nose or lips and the mask is applied to the face after the anesthetist has made certain that the end of the tube is under the mask. In this way one can administer ether by the open drop method, using the tube as an airway. This is valuable in operations on the brain because of the quiet respiration and less increased intracranial pressure than obtains when the tube is not used, especially if the airway is at all obstructed. This method is also a help in many orthopedic operations when the patient is lying on his face and must raise much of the weight of the trunk with each respiration.

Then a free airway is essential to adequate pulmonary ventilation. It is easier for the patient to breathe through the tube than without it, because the air passage between the vocal cords is usually greater with the tube in place than it normally is. The advantage of this method in intra-abdominal operations, especially in the upper part of the abdomen, is very striking. Quiet respiration permits the surgeon to approach deep-lying parts of the common bile duct without the edges of the wound in the abdominal wall moving more than the minimal amount. The diaphragm is quieter with the reduced effort of breathing, and the results are so encouraging that the tendency is to use the method as a routine rather than only in cases in which it obviously will be needed, as in operating on certain obese persons and on others who do not always take a general anesthetic well. Use of this tube in resuscitation is equally advantageous, and most anesthetists are now prepared to carry out resuscitation under most circumstances in which asphyxia has become a danger. The American Medical Association is greatly interested in resuscitation. It is to be hoped that surgeons will encourage anesthetists to interest themselves in it, and surgeons would do well to have them use the method from time to time so as to maintain their skill in its use.

Since so many agents and methods are available today, it is often possible for anesthesia to be induced with one agent, and, if the patient does not tolerate it well, to change to another. It is of no advantage to the patient to have to tolerate an agent poorly for too long, but many anesthetists delay longer than is actually desirable before deciding to change to another agent or method. This state of affairs no doubt is brought about by the change from the almost routine use of ether to the use of gases and local anesthetics in many cases, and perhaps is partly attributable to pride in being able to anesthetize all patients with one agent or method. In my experience it is more satisfactory to all concerned not to push an agent or method beyond its ordinary limitations, and certainly over a period of years it will be found safer to temper the use of an anesthetic agent.

When the intratracheal method is not available, either because of lack of tubes or of an experienced person to place them, the use of tribrom-ethanol by rectum is of advantage. It may also be used in order that fireproof conditions can be maintained.

If anesthetic rather than analgesic doses of cyclopropane are to be administered, I have found that one should palpate the pulse at short intervals throughout the procedure, and, if the volume or the rate changes, it probably indicates that the patient is not as tolerant of cyclopropane as the average patient, and he exhibits this intolerance through the cardiocirculatory system. My idea is that the gas should be used only in that concentration which does not markedly affect the pulse. I prefer to add ether rather than to increase the concentration of the gas and further to disturb the character of the pulse. However, if patients are tolerant of this gas, or if an anesthetist is experienced in its use, a patient can be carried to a profound degree of anesthesia, but this procedure is not advisable for the inexperienced anesthetist. The experienced anesthetist often can safely administer cyclopropane by Guedel's apneic technic,² and it may be of considerable advantage in operations for diaphragmatic hernia through the abdominal approach and in certain operations in and on the chest when the patient has difficulty in ventilating himself.

From the Section on Anesthesia, the Mayo Clinic.
Read before the Section on Surgery, General and Abdominal at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1937.
1. Tuohy, E. B. Intratracheal Anesthesia. *Proc. Staff Meet. Mayo Clin.* 11:91-95 (Feb.) 1936.

2. Guedel, A. E. and Ansel, J. H. Ventricular Fibrillation in Anesthesia. *Am. J. Surg.* 31:496-499 (Dec.) 1936.

For preliminary medication³ I think that a barbiturate, morphine and atropine have shown themselves to be worth while, especially if the barbiturate that is given before operation is administered in two doses, half the night before operation and the other half the morning of operation. Most of the apprehensive patients come to the operating room without nervousness or fear. Moderation in the dose of preliminary medication is more satisfactory and safer than when large doses are employed. Tribrom-ethanol by rectum has been recommended in place of other preliminary medication, and when used in basal anesthetic doses only it is useful, especially when the patients are children.

Local, regional and spinal anesthesia have been combined with general anesthesia, often to advantage.⁴ Infiltration along the line of incision for abdominal operations, together with gas anesthesia, especially with cyclopropane, has given excellent results and carries with it a minimum of untoward reactions. Field blocks, such as those of the cervical nerves and the brachial plexus, minimize the amount of general anesthetic that may be needed if the block is not entirely satisfactory. Spinal anesthetics administered in moderate doses are particularly useful in operations in the upper part of the abdomen. The danger lies in the degree of paralysis and the height to which it rises, in order to keep this within safe bounds, specific safe doses should be administered. When the patient is debilitated or the concentration of hemoglobin is less than 50 per cent, a spinal anesthetic should not be administered. When spinal anesthesia is not entirely adequate, cyclopropane in analgesic doses has made a most desirable combination, that is, wherever an inflammable gas may be used.

The safest agent from the standpoint of experience is procaine. The next is metycaine (benzoyl- γ -[2-methyl-piperidine]-propanol hydrochloride).⁵ Whereas there was a time when it was considered essential to have anesthesia last for a long time, in the last two years spinal anesthesia with agents of shorter action has been used. I shall not discuss the agents of which the effects last longer, for they are not as safe as the shorter acting agents.

Metycaine is a somewhat more potent agent than procaine, and in addition it is a good surface anesthetic. Metycaine in 1 per cent solution produces anesthesia more quickly than does 1 per cent procaine, and the anesthesia is more profound and lasts longer. This is especially noticeable in sacral block anesthesia. For spinal anesthesia, metycaine should be used in a smaller dose than the estimated dose of procaine for the same purpose. In addition to its advantage over procaine as a surface anesthetic, it is interesting that individuals who are sensitive to procaine usually can tolerate metycaine without untoward results.

Peridural⁶ injection of from 30 to 50 cc of a 2 per cent procaine-epinephrine solution can be used as a substitute for spinal anesthesia and should have the advantage that it does not produce lumbar puncture headache subsequently. Its value depends on experience in its use and, the technic of its administration once mastered, it produces good results.

Recently there have become available two drugs,⁷ sodium n-methyl-cyclohexenyl methyl malonyl urea (evipal soluble) and sodium ethyl 1-methyl butyl thiobarbituric acid (pentothal sodium), which can be administered intravenously. Anesthesia is quickly induced, its effect is transient, and the patient awakes without nausea, vomiting or restlessness in nearly all cases. This method is of importance to the surgeon because of the short duration of the anesthesia and because of the fireproof conditions surrounding its use, especially since diathermy and the cautery are so generally employed. One can have fireproof conditions using nitrous oxide and oxygen by simply administering intermittent injections of one of these two drugs instead of adding ether to the gases. This method is of considerable advantage in inducing anesthesia and then maintaining it with inhalation anesthesia if there are patients who are sensitive to general anesthetics. There are even those who suffer from a type of infection which, together with an inhalation anesthetic, throws the patient into convulsions. This is seen from time to time when young persons are suffering from acute appendicitis. If convulsions develop, it is advisable to have at hand one of the barbiturates, with which the convulsions can be controlled while measures for further treatment are instituted, that is, if the patient can be saved at all. In such cases the use of tribrom-ethanol preoperatively will minimize the number of instances in which convulsions will develop.

Intravenous anesthesia can be used when removal of packs is painful, when a T tube must be removed from the common bile duct, and in many cases in which a specimen is to be taken for biopsy but the piece of tissue to be removed is so small that it may be lost through injections of local anesthetics. The technic of intravenous anesthesia is a very important factor, together with its contraindications. It should not be used in operating on children who are less than 10 years of age, because it is a respiratory depressant. It should not be used if patients have marked dyspnea from pulmonary or cardiac disease or if this symptom develops in the course of operation. If preliminary medication is to be used, the dose of intravenous anesthetic will be reduced. I prefer to give the patient preliminary medication, either a barbiturate, or morphine and atropine, or both. The anesthetic agent should be in 5 per cent solution. Anesthesia should be induced in thirty seconds rather than in ten. Respirations should not be entirely stopped at any time and a cotton or paper "butterfly"⁸ should be used to show that the airway is patent and is being used. If the solution is injected extravenously, the spot of injection should be massaged to hasten immediate absorption, and moist, hot compresses should be applied for three or four hours. In this way soreness can be avoided in almost all instances.

At present the choice of anesthetic agents and methods is not only wider than ever before, but there are, in many places, physicians who have trained themselves in the use of all these various agents and methods, so that today there are really professional physician anesthesiologists in the full sense of the word. The demand for the services of these men is widening rapidly, so that in the near future they probably will be more widely available, and, as they are, the number of anesthetics to choose from will increase also.

³ Lundy J S. Role of Preliminary Medication in Anesthesia. *Surg Gynec & Obst* 63: 117-119 (July) 1936. The Relationship of Preliminary Medication to Anesthesia. *J Indiana State M A* 29: 363-364 (Aug.) 1936.

⁴ Lundy J S and Tuohy E B. Regional Anesthesia. Agents and Methods. *Am J Surg* 34: 511-518 (Dec.) 1936.

⁵ Tuohy E B. The Use of Metycaine in Spinal Anesthesia. *Surg Gynec & Obst* 39: 45 (July) 1937.

⁶ Odom C B. The Use of Epidural Anesthesia in General Surgery. *New Orleans M J S J* 89: 348-355 (Jan.) 1937. Sword Brian. Personal communication to the author.

⁷ Lundy J S. Intravenous Anesthesia. Preliminary Report of the Use of Two New Thiobarbiturates. *Proc Staff Meet Mayo Clin* 10: 536-543 (Aug. 21) 1935.

⁸ Lundy J S. A Method of Minimizing Respiratory Depression When Using Soluble Barbiturates Intravenously. *Proc Staff Meet Mayo Clin* 10: 791-792 (Dec. 11) 1935.

ABSTRACT OF DISCUSSION

DR HENRY S. RUTH, Philadelphia In surgery of the upper part of the abdomen, technical difficulties frequently present themselves to the surgeon, and therefore it follows that a qualified anesthesiologist should be of greater comparative value in this situation. Surgical intervention in the upper part of the abdomen, especially when on the bile tract, usually requires complete muscular relaxation, to which, in order to facilitate manipulations, should be added quiet respiration, because of the proximity of the diaphragm. Further difficulties are added by the bony framework of the lower chest wall, and the tendency of the pliable and bulky liver to obscure the field. Many nerves and plexuses are found in this region. These should be protected whenever possible from stimulation arising through severe retraction, necessary packing and raising the gallbladder neck. In some instances, reflex stimulation from this area produces a profound reaction in some patients. It has been suggested that this reaction has been caused by stimulation of the celiac plexus. Other reflexes from the same area produce vocal cord adduction and contraction of the abdominal wall. Abdominal packs and marked muscular retraction curtail movements of the diaphragm, which decrease minute volume respiratory interchange leading to oxygen want, especially when associated with paralysis of the intercostal muscles produced by a high spinal anesthesia or inhalation anesthesia carried to full third plane, third stage. The use of the catheter will preclude vocal cord adduction, and after insertion, second plane anesthesia frequently is satisfactory, for the response of the abdominal muscles to these reflexes is prohibited at this point. When an inflatable cuff is attached to the tracheal end of the catheter, aspiration of vomitus is prevented, which may have been caused by reflex stimulation at the site of operation, and also distention of the stomach during the institution of the apneic technic or artificial respiration is prevented. The addition of closed carbon dioxide absorption technic to the use of the endotracheal catheter provides many quite acceptable features. The closed carbon dioxide absorption technic may be applied by either the to and fro method or the closed circle system. Dr Lundy has presented an excellent summary of recent advances in anesthesia, but I should like to insert a supplemental word to the effect that a greater technical ability and a more comprehensive knowledge of allied basic sciences are necessary to carry out safely some of these procedures.

DR RALPH M. TOVELL, Hartford, Conn. The longer acting drugs for spinal anesthesia commonly employed are nupercaine and pontocaine. The toxicity of pontocaine is ten times that of procaine, whereas the toxicity of nupercaine is thirty times that of procaine and approaches that of cocaine. The relative toxicity of pontocaine, because the dose is smaller, is practically equal to that of procaine. The relative toxicity of nupercaine in my experience, however, considerably exceeds that of procaine. When an untoward reaction occurs after the use of nupercaine, it is directed toward the cardiac side of the cardio-respiratory center. When the untoward reaction is on the respiratory side, something may be done for it and usually the treatment is successful. This is not true of nupercaine. When an untoward reaction occurs with it there is little that can be done to improve cardiac action. The duration of the anesthesia obtained with pontocaine is from one to two hours, whereas that obtained with an average dose of nupercaine may be from three to four hours in certain instances. With the nupercaine the anesthesia outlasts or may outlast the operation considerably, and it may complicate the situation when surgical shock occurs postoperatively. Nupercaine and pontocaine should be given to a limited group of patients. They should be distinctly hand picked, and nupercaine should be reserved for those cases in which the operation is expected to exceed two hours. There is one other problem that is common to all types of spinal anesthesia, and that is the control of blood pressure. The ordinary routine is to give 50 mg of ephedrine preoperatively. If the blood pressure decreases during the operation, there are several alternative methods of treatment. One is the subcutaneous injection of epinephrine, which produces some increase in blood pressure. It may also be used intravenously. Under these circumstances the gradient of increase in blood pressure is rather steep, and the reaction is transitory. Ephedrine may be given intravenously in 25 mg

doses with satisfaction. There are other closely allied drugs but they function best as local vasoconstrictors. Benzadrine is a weak vasoconstrictor, which is unique in that it is volatile. It may be given by inhalation just as amyl nitrite is given. Frequently spinal anesthesia is supplemented by general anesthesia. By the addition of a simple piece of apparatus to the gas machine, benzadrine inhalant may be administered without disturbing the concentration of the anesthetic gases. This apparatus directs the flow of gases through a glass jar which contains the ampule of benzadrine. Although many situations can now be controlled successfully, research for satisfactory drugs to control blood pressure during spinal anesthesia must continue. It is essential that these potent drugs should be used only by those who know their actions and reactions thoroughly and who know how to control them.

GASTROSCOPIC STUDIES

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Physicians are all familiar with the obscure and highly unsatisfactory status of gastritis which prevailed before the epoch-making studies of Knud Faber¹ and his associates. Their work served as an impetus to others and furthered efforts to extend our knowledge of this most important entity.

After Faber's work came the equally valuable studies of Konjetzny,² Kahma,³ Puhl⁴ and others, these were directed chiefly toward research in regard to the stomach preparations obtained from patients on whom gastrectomy had been performed.

Later came the brilliant contributions to the subject from the pens of Schindler,⁵ Gutzeit,⁶ Henning,⁷ Chevaller,⁸ Moutier⁹ and Swalm and his associates,¹⁰ in these, direct studies of the gastric mucous membrane were made possible by the flexible gastroscope. We believe that ultimately the value and dependability of this instrument will be soundly established.

The diagnosis in the cases here presented was based solely on gastroscopic observations, and it is our belief that gastroscopy is the only method on which a reliable diagnosis can be founded. We are thoroughly con-

From the Digestive Clinic of Johns Hopkins Hospital. Read before the Section on Gastroenterology and Proctology at the Eighty-Eighth Annual Session of the American Medical Association Atlantic City, N. J. June 11, 1937.

- 1 Faber Knud Arch f. Verdauungskr. 10 333 1904. Faber Knud and Bloch C. E. ibid. 10 1 1904. Faber Knud Die chronische Gastritis Nord med Ark 1905. Verhandl. d. deutsch. Gesellsch. f. inn. Med. Kong. 40 1928 pp. 209-220.
- 2 Konjetzny G. E. Zentralbl. f. Chir. 50 1026 (June 30) 1923. Beitr. z. path. Anat. u. z. allg. Path. 71 595 1922-1923. Entzündungen des Magens in Henke Friedrich und Lubarsch Otto Handbuch der speziellen pathologischen Anatomie und Histologie Berlin Julius Springer 1928 vol. 4 part 2 Arch. f. klin. Chir. 129 139 1934.
- 3 Kahma Tanno Arch. f. klin. Chir. 128 20 1924.
- 4 Puhl Hugo Virchows Arch. f. path. Anat. 260 1 (Sept. 20) 1926.

- 5 Schindler Rudolf Lehrbuch und Atlas der Gastroskopie. Munich J. F. Lehmanns Verlag 1923. München med. Wchnschr. 78 1776 (Oct. 16) 1931 and 79 1268 (Aug. 5) 1932. Diagnostic Gastroscopy with Special Reference to Flexible Gastroscopy. J. A. M. A. 105 352 (Aug. 3) 1935. Clinical Value of Gastroscopy. Proc. Staff Meet. Mayo Clin. 11 747 (Nov. 18) 1936. Schindler Rudolf Ortmyer Marie and Renshaw J. F. Chronic Gastritis J. A. M. A. 108 465 (Feb. 6) 1937.
- 6 Gutzeit Kurt Ergebn. d. inn. Med. u. Kinderch. 75 1 1929.
- 7 Henning N. München med. Wchnschr. 79 1269 (Aug. 5) 1932. Die Entzündung des Magens. Leipzig Johann Ambrosius Barth 1934.
- 8 Chevaller Rene La gastrite per ulceruse. Diagnostic gastroscopique. J. de med. de Lyon 17 73 (Jan. 20) 1936. Early Gastroscopic Diagnosis of Antropyloric Carcinoma. ibid. 17 719 (Nov. 5) 1936. Chevaller Paul and Moutier François Gastric Hemorrhages and Their Endoscopic Control. Presse med. 11 1814 (Nov. 14) 1936.
- 9 Moutier François Les gastrites sous le contrôle de la gastroscopie. Pre se med. 41 1832 (Nov. 18) 1933. Les gastrites. Soc. de Gastro-Enterol. de Paris. Dec. 10 1934. Traité de gastroscopie et de pathologie endoscopique de l'estomac. Paris Masson & Cie 1935. Les gastrites. Premier Congrès international de gastro-entérologie. Brussels 15 310 1936.
- 10 Swalm W. A. Jackson C. I. and Morrison Lester. Rev. Gastroenterol. 3 219 (Sept.) 1936.

vinced that a history of alcoholism, of dietetic indiscretions or of tabagism cannot furnish reliable data on which to base a diagnosis of gastritis, and we are also skeptical as to the diagnostic value of roentgenograms in such cases.

We cannot distinguish between gastritis and the dyspepsias or between separate types of gastritis on the basis of symptoms. We can say only that all the gastric patients that we have seen had symptoms referred to the stomach, the most common and suggestive one being a sensation of fulness and pressure pain. We believe that this comes from the stretching of inflamed walls.

So far, secretory studies have been of no value in indicating the presence or type of gastritis. We have seen inflammation with achylic, normal and hyperacidic fluids. We have seen atrophy with achylia, achylia without atrophy and atrophy with normal gastric juice.

Instead of a detailed analysis of cases, we are presenting our impressions relating to the problem as a whole. These impressions are derived wholly from our careful gastroscopic studies, and we fully realize that our data and interpretations need further study and more conclusive proof before finality can be given to the statements which follow.

In addition to the definite syndrome acute gastritis, described by Faber, inflammatory gastric changes of a chronic or subacute nature frequently occur.

Gastric mucosa is normal when it is unblemished, smooth, glistening, translucent and orange-red, similar to the normal mucous membrane elsewhere in the body. Most healthy people have this type of gastric mucous membrane, which varies surprisingly little in appearance. Gastroscopically we occasionally observe in the gastric mucosa of healthy fasting subjects small red streaks, which are quite easily recognizable as being due to irritation from passage of the tube. Another abnormality in otherwise normal-appearing stomachs is submucosal hemorrhage, varying from the size of a pea to several centimeters in diameter and protruding from the gastric wall. We see these hemorrhages in probably 7 per cent of the cases, located in areas where it is certain there has been no trauma due to the instrument. There is no injection or reaction around them, they are apparently gradually absorbed, some of them, at least, result in small, round black, pigmented spots. We do not know how to interpret these hemorrhages, nor do we know the nature of the pigments or what tissue forms them. It is in stomachs in which they appear that hemorrhage along the course of the instrument is observed. We rarely see hemorrhage along the line of insertion without observing it in other areas also. We accordingly believe that these hemorrhages mean increased friability, and we know that they seem to cause severe pain at times, but we are not yet prepared to make any statement as to their significance.

When we examine gastroscopically patients with dyspeptic symptoms or definite gastro-intestinal disease, we begin to find a wide variety of changes in the gastric mucosa, apparently inflammatory in origin. Because of insufficient pathologic control, it has been impossible to establish, from gastroscopic appearances, the criteria by which disease entities may invariably be recognized.

There are several good working classifications of gastritis, the simplest being that of Schindler, with its three divisions of superficial, hypertrophic and atrophic. Moutier and others have adopted much more complex

classifications based on these three divisions. We believe Schindler's classification is the most satisfactory at present. It is based on a clinical concept. That the three types remain distinct and that atrophy is apt to be an end result of superficial gastritis we of course have not had the experience to verify. To some extent we have been forced to resort to classification on appearances. We are at the moment uncertain whether we can always distinguish between superficial and deep lesions. We also have difficulty in reconciling some of our observations with the words "superficial" and "hypertrophic." We have been able to observe all previously described types and agree that they seem to remain constant over a long period. However, we are not convinced that these constitute separate disease entities, with all their connotations, such as symptomatology, pathology, prognosis and treatment. We have consequently adopted no classifications as final and have tried to group cases on a basis of the activity of the process.

Most gastric stomachs show definite activity, that is, the lesions seem active. There are evidences of inflammation, hypertrophy, ulceration, hemorrhage, edema and localized injection. This majority includes the superficial and hypertrophic classes described by Schindler. In a small percentage of cases the lesion seems inactive and atrophied. It then corresponds to the atrophic gastritis of Schindler. Without attempting to form or to criticize any classification, we might question whether the important point is not the severity, location and extent, rather than the actual type.

Cases in which gastritis is active seem to fall into several groups. In the large majority there is evidence of definite inflammation. The color has lost the orange tinge and has become dusky red. Grayish mucus is adherent in patches or hanging from the wall like ropes. The glistening highlights are lost. There may be areas of redness, localized injection or submucosal hemorrhage. In the more severe cases one occasionally sees small superficial erosions, some a centimeter in diameter. The margins of these ulcerations sometimes appear slightly indurated. We term this picture superficial gastritis, although Schindler groups the hemorrhagic and erosive pictures under hypertrophy.

In the definitely inflammatory group we also frequently find individual rugae appearing edematous, with hemorrhage or injection or both. This group provides one of our difficulties in classification. The changes are inflammatory and resemble the ones described under the superficial group, but they are obviously more than mere surface changes. On the other hand, the involvement seems to be more an acute edema than an actual proliferation or hypertrophy. We therefore classify all such cases as inflammatory.

Another group consists of cases in which inflammation, if present, is not a predominant feature. In these the mucosa appears normal or nearly normal in color but is thickened. The highlights are present, abnormal mucus is not a feature and hemorrhage is infrequent. The rugae appear large. Individual rugae often seem thickened and nodular but do not give the impression of edema. In a few such cases small warty nodules occur either on the crests or in the valleys between the folds. We frequently see small patches of mucosal thickening, particularly between folds resembling thickened mucosal bridges in healing colitis. The observer receives the impression of hypertrophy, a slower, less active process. Such conditions we call hypertrophic gastritis.

Two other types are recognized which cannot easily be fitted into the inflammatory or hypertrophic groups. First, infrequent cases in which active inflammation is less evident but the entire stomach wall is involved in multiple small, flat hemorrhages and erosions. The few cases of this type that we have seen have also differed from the others in the rapidity with which the process disappears and then recurs. Second, cases in which there is a well marked granular appearance in the preantral zone, localized particularly on the anterior wall. The area involved is usually deep red, otherwise the stomach is normal.

At this point it is in order to mention the postoperative appearance of the stomach. It is more and more evident that considerable damage is produced by the mere opening of the stomach. Of fifteen cases, we have seen only one in which inflammatory changes were not active and severe. In this exception an anterior gastro-enterostomy had been performed two years before. The man had had repeated massive hemorrhages without ulceration or abnormality being demonstrated by x-ray examination or by operation. So far as we could tell, the stomach was perfectly normal except that a line of old hemorrhage and the spots of pigment previously described stretched across the greater curvature in mid-stomach. With this exception, all the gastro-enterostomized stomachs were badly inflamed, even two years after operation. The gastritis is generally of the active, inflammatory type, with edema and reddening the predominant characteristics.

We have not observed actual ulceration in these stomachs, nor does hemorrhage seem frequent. The severest reaction is generally located in the vicinity of the enterostomy, the tissues often being so swollen that the opening is invisible. In other stomachs the reaction seems to be more general than local.

Other gastroscopists have often remarked that a properly functioning artificial opening resembles the pylorus and acts in much the same way by rhythmic contraction. We have observed this action in only one stomach, in which the opening was located close to the pylorus on the posterior wall. When one realizes that a simple incision of the gastric wall will produce inflammatory changes in the gastric mucosa which persist for months, it is obvious that some of the symptoms following gastric operation arise from this general and localized reaction.

In the active gastritis group we may mention the association of gastritis with gastric or duodenal ulcer. This subject has been partially worked out by pathologists and surgeons. We have only a few observations to make concerning this type of gastritis. One is that the severity of the ulcer seems to be no index of the degree of gastritis. Although all classes occur, even atrophy, the superficial inflammatory type predominates. We should like to suggest that the two diseases may be considered as distinct. The ulcer seems to clear far more readily than the gastritis. We believe that in some of our histories the two may be separated on symptomatology, the immediate dyspeptic element being due to gastritis. We have rarely been able to find the juxta-pyloric gastritis described by Faber and other pathologists, though we have no explanation for this. We do not deny its frequency, we simply state that gastroscopically juxta-pyloric gastritis seems rather uncommon.

The second great division is the passive inactive or atrophic group. In uninvolved atrophy no active inflammation is present. The mucosa merely looks thin and

unhealthy. Advanced, unquestioned classic atrophy is characteristic. The rugae are usually absent, though not invariably. If present, they thin out under inflation. The color is bluish gray. The mucosa looks thin, and a network of blue veins is the most noticeable feature. Here again considerable variation occurs, and one wonders just what to call disease. One frequently encounters areas in which bluish veins are visible, and we believe that, normally, blood vessels are visible on the anterior wall of the preantral zone and increase in visibility under inflation. Occasionally the mucosa in these areas has a bluish tinge. When this is present the condition is called atrophy. If these areas are noticed only when the stomach is fully dilated, the diagnosis is uncertain, since mere dilatation, as Faber has most reasonably remarked, will thin the mucosa. In other cases the mucosa has a yellow tinge, varying from normal in the absence of rugae, loss of the red element, and the presence of large, widely branching blue vessels. We wonder whether this differs from other atrophy in degree or in the nature of the process.

In many cases there exists, in addition to the ground-work of atrophy, a superimposed activity, generally of the superficial type.

The most marked evidence of atrophy is of course found in pernicious anemia, but little work has yet been done on the localization of these changes, as previously pointed out. It is to be particularly stressed that in atrophy the changes frequently tend to become localized in one of the six zones of the stomach. Here again we emphasize that it may make some difference in which area the change occurs, whether in the region where the intrinsic factor is produced or primarily in the acid-producing areas.

We have under treatment at present one patient with severe pernicious anemia, gradually recovering by means of liver extract. Only the mildest superficial irritation is present in the antral and preantral zones, but severe atrophy, together with some activity, apparently superficial, is sharply localized in the proximal anterior and posterior walls.

Localized atrophy in pernicious anemia brings us to several interesting questions. If atrophy interferes with the function of the involved mucosa, it would seem that gastritis localized in the antrum might result in pernicious anemia with normal acidity, or that atrophy localized in the acid-bearing region, not involving the antrum, might produce achylia without pernicious anemia. It is possible that recovery might take place in either case, and that recovery does occur has been indicated by Jones, Benedict and Hampton,¹¹ as well as by foreign scientists. Aside from pernicious anemia, however, we run unexpectedly into atrophic gastritis. For instance, in some cases atrophy involved the entire stomach and yet the patient had no blood changes. Symptomatically we can see no difference between these cases and any other cases of gastritis.

One important fact stands out, that is, that these cases do not conform to previous clinical suppositions. They do not seem to follow atony, achylia, flaccidity or body type.

We have every intention of continuing our researches and have set forth in this contribution our studies to date in the hope of stimulating other workers to increased activity in this fascinating field of endeavor.

12 East Lager Street

¹¹ Jones, C. M., Benedict, E. B. and Hampton, A. O. *Ann. J. M. A.* 190-296 (Nov.) 1935.

ABSTRACT OF DISCUSSION

DR EDWARD BENSON BENEDICT, Boston In the past four years at the Massachusetts General Hospital we have examined some 500 stomachs by gastroscopy, using the Wolf-Schindler flexible gastroscope. We have found this instrument of great value in the diagnosis of ulcer and carcinoma, but particularly useful in gastritis. In gastritis I think it is important to have a working classification, though I do not believe that any classification can be hard and fast. Dr Schindler's classification is the simplest, considering the cases as superficial, atrophic or hypertrophic gastritis.

DR RUDOLF SCHINDLER, Chicago It has been contended that, although gastroscopy be the only reliable method, chronic gastritis often can be diagnosed by the anamnesis alone. It is to the great merit of Drs Gaither and Borland that they have taken up this question by systematic gastroscopic research. My own opinion is based on more than 1,500 cases observed clinically and gastroscopically, many of them over a period of months and years, up to twelve years. I believe, as do Drs Gaither and Borland, that the diagnosis of that frequent disease is possible only gastroscopically, that anamnesis, physical examination, laboratory methods, and especially x-rays generally are useless for a correct diagnosis. Gross hemorrhages, even with fatal end, have been described in chronic gastritis by all gastroscopists. It is typical that the patient felt fine although the severe alterations of the mucosa were still present. Anacidity in such cases is not frequent. Hyperacidity is found in many instances. An infinite amount of such case reports could be given. Chronic gastritis is a severe disease and all symptoms are variable. I agree with Drs Gaither and Borland that no definite observations are conclusive except the gastroscopic ones, which, for the expert, are diagnostic.

DR WILLIAM A SWALM, Philadelphia There is one point I should like to bring out and that is that hypertrophic gastritis has been seen in one portion with atrophic manifestations in other parts of the stomach. Mays recently published histologic observations in which there was ulcerative gastritis with a hemorrhagic infarct at the deeper part of the ulcer, and in another portion of the stomach an atrophic gastritis. He noted that hemorrhage was more likely to occur when an infarct was deeply situated. Another important point is that we must bear in mind that, when x-ray examination shows duodenal defects, the problem of spasm due to gastroduodenitis must be kept in mind, as shown in the cases of Faber and Andersen. Gastroscopy has revealed gastritis in cases in which x-ray examination showed duodenal defects without crater, but I have not had operative proof of whether ulcer was present or not.

DR BURRILL B CROHN, New York Hemorrhagic colitis, like hemorrhagic gastritis, lends itself to extensive, severe, often exsanguinous hemorrhages. In a case of right-sided colitis, eight years after a supposed cure, a sudden hemorrhage was so severe that this young woman's hemoglobin dropped from 100 per cent to 28 per cent within four hours. This hemorrhage was again repeated. Subtotal colectomy was performed. The mucous membrane was congested and showed no discrete ulcerations but a hyperplastic mucosa without definite points of ulceration but covered with petechial areas from which the blood had transuded. I believe that Dr Gaither published last year an article on the evaluation of gastroscopic surgery in which he spoke favorably of the end results of gastrectomy. Did I understand him to say that, in fifteen of sixteen cases of gastrectomy, severe gastritis was present postoperatively? If so, how does he harmonize his very satisfactory clinical report of cases of gastrectomy with his gastroscopic picture of gastritis?

DR JAMES L BORLAND, Jacksonville, Fla Dr Crohn's remarks concerning the amount of bleeding that may occur from a small lesion are well made. We observe quite large hemorrhages from quite small lesions by gastroscopy. We do not offer these observations as contraindications to surgery, of course. We merely indicate that, whenever the stomach is opened considerable residual inflammation remains for quite long periods and many of the postoperative symptoms are probably due to this. We suggest that patients who have had

gastric surgery must be followed for some time and that more attention must be paid to their diet than has hitherto been the case. I should like to reemphasize the point also that the diagnosis of gastritis still is obscure. I believe that we have encountered a new field of pathology and one that is worth careful consideration. What the outcome will be I think no one can say at present. It may be that we shall conclude that many of the things that we now call gastritis will in the future be totally disregarded. It being a new field, however, we must attempt to evaluate even the smallest variation from normal until such time as continued observation shall have demonstrated the true status.

DR ERNEST HOWARD GAITHER, Baltimore In answering Dr Crohn, the cases that we reported were thoroughly investigated from a clinical standpoint, the clinical histories were taken with great care and were exactly as reported by the patients. We noted those in which the patients were greatly helped and also those claiming to have been cured. Dr Borland and I have shown in our research that the localized appearance of the mucous membrane certainly cannot be taken as a final criterion as to the severity or mildness of symptoms. Symptomatically, some of the patients presented every evidence of erosions and gastritis, yet after careful gastroscopic examination it was discovered that changes were extremely mild or practically nil. In many patients who presented the most outspoken symptoms, the mucous membrane was practically normal.

Clinical Notes, Suggestions and New Instruments

EFFECT OF SULFANILAMIDE ON THE OXYGEN CAPACITY OF THE BLOOD

J W MULL PH D AND J T SMITH MD CLEVELAND

In view of the rapidly increasing use of sulfanilamide, observations of its effect in individual cases may be of considerable value. The following history shows that in one case at least there was not only a cyanosis, which is frequently observed, but an actual lowering of the capacity of the blood for oxygen.

A well developed young woman, admitted to the Maternity Hospital June 21, was delivered the same day by breech extraction of an eight and one-half to nine months baby boy.

Blood Determinations

Date	Oxygen In Volume per Cent		Per Cent Saturated	Grams Hemoglobin			White Blood Cells	Red Blood Cells
	Con tent	Capac ity		Oxygen Capac ity	Alkaline Hematin			
6/21/37*	12.99	14.74	88.1	10.62				
6/26/37							5,400	2,760,000
6/28/37							11,200	
6/29/37	5.17	12.97	39.8	9.30	10.7		7,900	3,400,000
6/30/37								
7/1/37	6.3	10.73	59.1	7.63	8.7			2,510,000
7/2/37	4.0 cc of whole blood given							
7/3/37	5.30	16.33	37.0	11.97	11.8			3,430,000

* Taken at delivery.

weighing 2,640 Gm. The delivery was made under ether anesthesia with morphine and scopolamine during labor. A first degree laceration was repaired at the time of delivery. The child was normal and showed no unusual symptoms while under our observation. After a few days the mother began to complain of pain in the lower part of the abdomen which was accompanied by a profuse lochia with a very offensive odor, occasional nervous chills and a temperature varying between 37 and 39.9 C (98.7 and 104 F). This purulent lochia persisted in spite of treatment and on June 26 the patient was placed under isolation precautions. June 27 at 1: p m with a temperature of 39.5 C (103.1 F), she

suffered a severe chill lasting twenty minutes. Twelve hours later 15 grains (1 Gm) of sulfanilamide was given. The following day, the 29th, 15 grains was given at 6 a m and 11 a m, and, on the 30th, 15 grains was given at 6 a m, 11 a m, and 5 p m, and at 11 p m a final dose of 5 grains (0.32 Gm). Cyanosis developed almost at once and on the 29th the oxygen capacity of the blood was determined by the manometric method of Van Slyke and Neill.¹ The results of this determination, together with the subsequent ones and that made at the time of delivery, are given in the accompanying table. From these figures it is apparent that the patient suffered not only a sharp drop in the oxygen content of the blood but also a distinct fall in the capacity of the blood for absorbing oxygen. The blood showed a peculiar color when aerated, never attaining the bright red of normal oxygenated blood. The differences in the hemoglobin by the oxygen capacity method and the alkaline hematin method are also significant of the inability of the blood to take on oxygen normally.

Following the reduction in the dose of sulfanilamide on the 30th, the drug was discontinued. July 2, 480 cc of whole blood was given by indirect transfusion, following which the patient made an uneventful recovery and was discharged from the hospital July 16. Blood cultures taken June 26 and 28 were reported as showing no growth in eight days. A spectroscopic examination failed to show either methemoglobin or sulf-hemoglobin.

These observations indicate the necessity not only for giving oxygen but also for increasing the capacity of the blood for taking up oxygen.

2065 Adelbert Road

ALLERGIC CONJUNCTIVITIS DUE TO FUNGI

FRANK A. SIMON, M.D., LOUISVILLE, KY.

Fungi can cause disease of man in two ways. 1. They may produce an infection. 2. Contact of fungi with mucous membranes may result in absorption of antigenic material with consequent development of hypersensitiveness without infection, subsequent contact with the same fungi results in an allergic reaction. In the past few years increased attention has been directed toward this hypersensitiveness to fungi without infection, although the condition has been known since the work of Storm van Leeuwen.¹ Many cases are now on record and the routine use of fungus extracts in allergic skin tests is becoming the accepted practice. Such routine tests indicate that in certain geographical locations at least, an appreciable percentage of allergic patients is sensitive to fungi; the work of Durham² indicates that the atmospheric concentration of fungus spores may approximate that of ragweed pollen grains.

In most of the cases reported the patients are sensitive to the air-borne spores of fungi and they have respiratory symptoms, particularly those of allergic rhinitis and asthma. The following case is believed to be of interest because of the fact that the symptoms are limited entirely to the conjunctivae.

A man, aged 38, gave a history of recurrent attacks of redness, itching and burning of the eyes during the past four years. These attacks were of variable duration, lasting from two or three weeks to several months. They were limited almost entirely to the summer and fall seasons although he had a few mild attacks during the winter and spring. His symptoms were most pronounced in June, July and August.

He lives in a very old damp, brick house surrounded by trees. His symptoms were worse at home and better on trips

away from home. He makes frequent trips to New York on air-conditioned trains and under these circumstances his symptoms are greatly relieved or entirely absent.

He had summer hay fever every year for three or four years but this left entirely and he has been free from such symptoms during the past three years. His past history is otherwise irrelevant. His daughter has hay fever.

Examination of the eyes by Dr. Claude T. Wolf revealed the conjunctival type of inflammation of both eyes without other involvement.

The results of skin tests are as follows:

1. Scratch Method. Slightly positive reactions to timothy, orchard grass, blue grass and oak pollens. Strongly positive reaction to the fungus *Alternaria*.

2. Intradermal Method. Moderately positive reactions to orris root, horse dander, ragweed pollen and several foods.

In correlating these results with the clinical history I found that the patient's symptoms did not coincide with the pollination season of any of the "plants" which gave skin tests. For example, he usually has conjunctivitis in July when there are no ragweed or oak pollens and practically no grass pollens in the air. His symptoms cannot be ascribed to foods because his diet is not subject to the seasonal variations, as indicated by the history. Nor can they be ascribed to orris root or horse dander because there is no clinical basis for such an assumption. These substances all gave small tests compared with that obtained with *Alternaria*. The seasonal variation of his symptoms is in perfect agreement with the sporulating season of fungi, as described by Feinberg.³

In order to investigate further the influence of fungi on the patient's symptoms, six Petri dishes containing Sabouraud's medium were exposed in different parts of his home. In a few days a good growth of fungi was obtained from which eighteen pure cultures were grown, and an extract of each was made with phenolated (0.4 per cent) physiologic solution of sodium chloride. The extracts of *Alternaria* and of *Cladosporium* gave definitely positive skin tests (scratch method). The other extracts gave negative tests. All extracts gave negative skin tests on control subjects. A drop of the *Alternaria* extract applied to the conjunctiva resulted in an intensely red, itching reaction, which it was necessary to control with solution of epinephrine. A drop of the same extract applied to the conjunctiva of a control subject had no apparent effect.

A series of thirty-one injections of the extracts of *Alternaria* and *Cladosporium* was given (plus ragweed and mixed grass pollens) beginning July 24, 1935, and ending March 15, 1937. During the summer of 1936 the patient's condition was greatly improved and in 1937 he had practically no conjunctivitis at all.

SUMMARY AND CONCLUSIONS

In a study of a case of conjunctivitis the following evidence indicates that the chief etiologic factor is an allergic reaction to the spores of air-borne fungi:

1. Seasonal variations in the patient's symptoms coincided with seasonal variations in the atmospheric concentration of fungus spores.

2. Changes in the patient's geographical location (with presumable changes in atmospheric concentration of fungus spores) were accompanied by changes in his symptoms.

3. Skin tests with fungus extracts were definitely positive.

4. The clinical symptoms of conjunctivitis were reproduced by the application of fungus extract to the conjunctiva (the control conjunctival test in a nonsensitive subject being negative).

5. The patient was exposed to fungus spores as shown by the fact that fungi were cultured in abundance from the air in his home.

6. Hyposensitization (desensitization) with fungus extracts was followed by relief of symptoms.

332 West Broadway

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From the Department of Medicine of the University of Louisville School of Medicine and the Bacteriological and Serological Laboratories of the Louisville City Health Department.

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Council on Physical Therapy

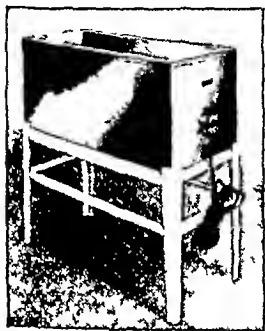
THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION
OF THE FOLLOWING REPORT HOWARD A. CARTER Secretary

THE PARAFFIN BATH ACCEPTABLE

Manufacturer Thermo-Electric Company, 717 Frankfort Avenue, Cleveland

The Paraffin Bath is recommended for controlling the heat of paraffin used in therapeutic treatments in the hospital or home. An Arm and Foot Bath, Model B Senior, was submitted to the Council for consideration. This particular model is 28 by 12 by 13 inches (deep) and weighs 85 pounds when crated for shipping. In the firm's opinion it is thoroughly insulated. It operates on either alternating or direct current. The heat regulating mechanism includes a time switch, a maintenance element independent of the former and a thermostatic high limit control.

Paraffin is placed in the inside of the bath. The latter is made of stainless steel with joints securely soldered. A coating of an electrical insulating cement covers the outside of the bath proper. The coating is baked on in a slow oven. Encircling the entire bath and covering the bottom is the melting element, which is laid on top of the cement. The maintenance element is placed on the bottom. The casing of chrome steel is then built around the sides and ends of the tub. Between this casing and the cement encased elements, mineral wool is packed firmly for insulation purposes. The bottom is packed similarly. A one piece wooden bottom cover is pressed on and fastened in place, so that the patient's extremity rests on wood rather than steel. The steel stand is finished in white enamel. A wooden cover, also white enamel, fits over the bath to keep the paraffin clean when not in use.



Paraffin Bath

In about two hours. The current thus used is 1,200 watts. The maintenance element will keep the bath at operating temperature, from 120 to 135 F, and will draw about 90 watts of current. The time switch can be turned on for only one hour or fractions of an hour at one setting. Consequently the bath may not be overheated when the operator forgets to turn off the switch. However, if the operator wishes to sterilize the bath it can be heated up to 212 F by turning on the time switch for an hour or less, after the bath is already heated.

According to the firm, the maintenance element is designed to keep the bath at the proper operating temperature. It will not heat the bath over 150 F even when the cover is on. The thermostatic high control comes into action only in event of failure of the other controls. It is set for 200 F unless the physician wishes it set at a higher point.

Different conditions prevailing at the various hospitals using the baths require corresponding variations in attention to the controls. For instance the maintenance element delivers sufficient heat to keep the bath melted and at operating temperature in a room of about 70 F, with the cover off the bath. If the bath is in constant use, the time switch will have to be turned on for five minutes at a time occasionally in order to keep the paraffin melted. If the bath stands for some time with the cover on, it becomes too hot for the patient to use. However, each operator can readily learn to operate the controls under the particular condition prevailing in his practice.

The only therapeutic claim made for the bath is that it affords a convenient method pleasant and soothing to the patient, of applying heat to the extremities. The heat is said to be steady and penetrating yielding a pleasant sensation of warmth and comfort which persists for several hours after the treatment.

The unit was investigated in a clinic acceptable to the Council and found to give satisfactory service and support the claims made for it by the manufacturers.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Paraffin Bath for inclusion in its list of accepted devices.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING
REPORTS PAUL NICHOLAS LEECH Secretary

PLANT'S MAGNESIA WAFERS OMITTED FROM N N R

Plant's Magnesia Wafers (Plant Products Company, distributor) were accepted in 1930 for use as an alkaline laxative and antacid. The last period of acceptance expired at the close of 1936. Repeated requests have failed to secure the necessary material for reconsideration from the distributor. Reply to one of the Council's letters was received but no reconsideration material was submitted with this letter, although it was stated that the product is still being marketed.

According to information in the Council's files, the marketing of the product is now being done by a firm other than the original distributor. Additional requests for reacceptance material have produced no reply.

Since the firm which originally submitted the product to the Council does not reply to the Council's requests, and since the present distributor of the product has not requested the Council's reconsideration nor has it submitted any material on which to base the reconsideration, the Council is obliged to omit Plant's Magnesia Wafers from New and Nonofficial Remedies.

NUPERCAINAL-"CIBA" NOT ACCEPTABLE FOR N N R

Nupercaine-Ciba (the hydrochloride) has for some time stood accepted by the Council as a local anesthetic. At the request of the distributor, the Council in 1931 took up consideration of the base, which at that time was marketed in the form of Nupercaine Ointment 1%. On account of the danger from the use of powerful anesthetics by the public the Council objected to the unsupervised use of Nupercaine for sunburn and burns. When informed of the Council's objection the firm asked that the consideration be withdrawn and was informed that the procedure of the Council did not permit "withdrawals" of consideration but that it was the Council's duty to inform the medical profession of any objectionable features if the product was still on the market.

Subsequently, the firm changed the name of the product to "Nupercainal-Ciba" and circularized the medical profession widely. When this was brought to the attention of the Council, packages were purchased on the open market, and it was found that the objectionable claims were still maintained and that the trade package contained the names of diseases. The firm was informed of this and further of the Council's objection to the coined proprietary name "Nupercainal." The Council's objection to the name is based on the fact that it tends to confusion and is against the public interest. It does not make clear that the active ingredient is Nupercaine, and further it creates the impression that the preparation is some chemical derivative of Nupercaine instead of being a simple mixture.

Some correspondence ensued in which the firm agreed to abandon the objectionable claims and to revise satisfactorily the trade package, in the end deleting from the label and tube claims which had been found objectionable and submitting a trade package to attest the omission of the trade package circular to which objection had been made. The firm, however, refused to meet the Council's objection to the name. The Council was therefore compelled to declare the product unacceptable for N N R. The firm was informed that the advertising for Nupercainal must be kept quite distinct from that issued for Nupercaine, else the acceptance of the latter might be jeopardized.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - CHICAGO, ILL.

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SATURDAY, FEBRUARY 5, 1938

DOCTORS, PARENTS AND TEACHERS

Since 1930 the American Medical Association has been officially represented on a committee of the National Congress of Parents and Teachers concerned with the Summer Round-Up of the Children a project carried out to improve the health of the preschool child. This movement was originated in the early 1920's, about the time when interest in infant health had reached its peak. In the preschool years, from 1 to 5, many physical conditions or bad health habits develop which may be detrimental to the child on entering school. The approach to the problem was determined by the method then in vogue in every public health movement, the establishment of clinics. The assistance of physicians was requested and in a great many localities freely given by them, even when they could not approve of some of the methods and results which were inherent in the clinic procedure.

The weaknesses of the original summer round-up plan were due mainly to the procedure by which examinations were made in assembled group clinics. This led to hasty examination, inadequate time for conferring with parents, sketchy recording and poor follow-up. Sometimes there were disagreements between the examining physician and the family physician, to whom the patient went ultimately for such treatment as was recommended following the examination. In 1934, therefore, the advisory committee for the summer round-up recommended a change in policy looking toward the examination of children in the offices of family physicians, with the payment of physicians for such examinations, when feasible, by the parents. This presented a difficult problem in transition from one method to another. The clinic method has the advantage of mass psychology, it is easier to get examinations made free in crowds than at a price in solitude, though the latter system

undoubtedly produces the better examination. To the credit of the national congress and its state congresses and local units, the initial falling off in numbers of children that were examined did not discourage them. They persisted at the task. The figures for the 1936 round-up, just published, justify the new policy and indicate that as time goes on it will become more widely used.

At a meeting of the Advisory Committee to the Summer Round-Up, held in New York January 21, and attended by the representative of the American Medical Association,¹ the following figures, among others referring to the 1936 round-up, were released. More than 7,000 units of the national congress registered for participation in the summer round-up, of which 3,996 carried it through and 3,662 met the required standards. In the communities represented by the registering units, 183,472 children entered kindergarten or first grade for the first time, 98,339 of these were examined, and 21,040 of the examinations were conducted in the office of the family physician. The number of children referred to a physician was 41,610, the number actually taken to a physician and so entered in the record was 16,019. More may have gone but not been reported. Children not previously vaccinated against smallpox who received this important prophylaxis numbered 44,071, diphtheria immunizations totaled 35,527, and typhoid vaccinations 3,521.

The blank for recording the examinations and the subsequent treatment has been donated by the American Medical Association, in part, through *Hygeia*. This blank has been revised from time to time. The latest revision, which has just been approved by the advisory committee, was made by the Bureau of Health and Public Instruction with the advice of numerous physicians who have had experience in the use of the blank. The new blank, greatly simplified as compared with previous editions, will be used in the 1939 round-up. Blanks for 1938 will continue in the older form.

The Summer Round-Up of the Children has been marked, for the most part, by the harmonious cooperation of the parent-teacher associations and the medical profession. Occasional misunderstandings have usually been readily adjusted. This contribution to the public health has been significant not alone in the value of the physical examinations, the medical treatments and the prophylactic inoculations growing out of them but in establishing the principle that the vital factor in medical care, including preventive measures, is the family doctor.

¹ Dr. W. W. Bauer.

² The Summer Round-Up of the Children. General Summary of Results of 1936 Campaign. Summary of Results by State Totals, and of Congress of Parents and Teacher. 1201 Sixteenth Street N.W., Washington, D. C.

INVESTIGATION OF SHELL-FISH
POISONING

In San Francisco in July 1927 an adult ate a dozen and a half mussels for supper and died of respiratory paralysis five hours later while asleep.¹ A 12 year old boy ate eight raw mussels and died three and a half hours later. A boy 2 years old drank a small glass of broth with three mussels and died in five and a half hours. Three other deaths occurred at that time, and a total of 102 persons from the central California coast area became ill of mussel poisoning. Since then, including the year 1936, ten more deaths have been known to occur from mussel poisoning in Alaska, in Oregon and along the California coast. In all, 243 persons have been made ill, all suffering unmistakably from mussel poisoning. Sixty-two cases were reported in California in July and August 1929 with four deaths, two cases in 1930, forty cases in June and July 1932 with one death, twenty-two cases in 1933 with one death, twelve cases in 1934 with two deaths, and three cases in 1936 with two deaths. The disturbance centered in the neighborhood of the Golden Gate extending roughly one hundred miles north and south. Outbreaks of shell-fish poisoning have also been reported from Scotland, Germany, Norway, France and Japan. Compared with the European outbreaks, the California epidemics involved much larger areas.

Investigators at the Hooper Foundation, University of California,² have been studying this problem to determine the source of the poison in the mussels and to isolate it if possible. The observations recorded in the last nine years have shown that mussel poisoning has occurred only in the summer months between May and October. Conducive to a large epidemic is a coincidence of fair weather and favorable low tides over the week ends, when most of the shell-fish are collected and consumed. The poisonous mussels were derived from the open shore of the ocean. Not a case of poisoning occurred from eating mussels gathered in San Francisco Bay or other bays. However, there is some evidence that mussel poison may at times exist within the bay of San Francisco. Quite recently highly poisonous shell-fish have made their appearance in southern California. Specimens of mussels collected from big Sycamore Canyon in southern California have shown high toxicity.

Poisonous mussels cannot be readily distinguished from normal mussels when collected. In the laboratory in aerated filtered sea water they function normally, and if scrubbed thoroughly and the water changed frequently in the first few days their mortality in the laboratory is no higher than that of normal mussels.

Although many theories were proposed to explain the occurrence of poison in shell-fish, as the investi-

gation progressed it became apparent that the poison was contained in the ocean water and approached the shell-fish beds from time to time from off shore. The search for the causative factor was narrowed to some substance in the water and a strong possibility was that it might be the food of the shell-fish. Mussels feed on plankton. Of the plankton forms used as food by mussels, it has been found that an increase in the number of certain species of the genus *Gonyaulax* occurred preceding and during each poison period. Brilliant displays of phosphorescence in the water have been noted at times preceding the occurrence of the poison in mussels. Large increases in the dinoflagellates have also been accompanied by patches of "red water" as the result of a change in the color of *Gonyaulax* from golden to reddish brown.

Stohler noted that the stomachs of the poisonous mussels were usually full of undigested food, while the stomachs of normal mussels were more nearly empty. A study of the food in mussels was begun in 1932. An identical poison was found in the sand-crab, which also feeds on plankton. A detailed count of the organisms in plankton during a period of strong toxicity in mussels showed the presence of *Gonyaulax catenella* in large numbers. This fact immediately aroused suspicion, and numerous qualitative and quantitative studies were made of the plankton forms used as food by the mussels.

The paralytic shell-fish poison was definitely demonstrated in 1933 for the first time in plankton residues. This poison was compared with an extract of poisonous mussels and found to be identical in solubility, insolubility, stability and symptoms produced in experimental animals. Furthermore, it was found in larger quantities when the toxicity of the nearby mussels was greater. Experiments showed a constant relation between the number of *Gonyaulax* in mussels and the amount of poison as measured in mouse units. The number of *Gonyaulax* per lethal mouse dose of poison was found to be about 3,000, from which it was calculated that the poison content of the *Gonyaulax* is of the order of 1 per cent of its weight. A simplified procedure for the demonstration of this poison in the plankton was devised in 1935, with which the poison can definitely be demonstrated in relatively small numbers of *Gonyaulax*.

Some bivalves other than mussels may become strongly poisonous. Three persons died in 1929 after the ingestion of Washington clams (*Saxidomus nuttallii*). Tests with various parts of the clam demonstrated that the poison is concentrated in the liver. The fact that the large clams are almost always cleaned of the viscera before cooking explains why clam poisoning is rare. A trace of the mussel poison has been found in other invertebrates (starfish, limpet and chiton), although in the experiments conducted it did not appear that these animals contained as much of the toxin as the mussels. While the toxicity curve of

1 Meyer K F Sommer Hermann and Schoenholz P. *Muscl Poisoning* J. Prev. Med. 2: 365 (Sept.) 1928.

2 Sommer Hermann Wheldon W F Kofoid C A and Stohler R. *Relation of Paralytic Shell Fish Poison to Certain Plankton Organisms of the Genus Gonyaulax* Arch. Path. 24: 537 (Nov.) 1937. Sommer Hermann and Meyer K F. *Paralytic Shell Fish Poisoning* *ibid.* p. 560.

the sand-crabs studied ran parallel to that of the mussels generally, sometimes the poison is demonstrable in crabs when it can no longer be detected in mussels.

These studies point to certain species of the genus *Gonyaulax* in the food supply of mussels along the western coast at certain times of the year as the source of the paralytic poison. The prevention of mussel poisoning nevertheless remains a difficult problem. It is impossible without frequent animal tests to warn of the approach of the poisoning period. The public should be informed about the consumption of shell-fish gathered from certain areas, it being pointed out especially that the livers of mussels and the broth may be very poisonous during the summer months. A more practical method of prevention would be to establish a closed mussel season during the summer months. Mussel quarantines have been established by health departments in some of the affected communities.

The treatment of mussel poisoning is symptomatic and therefore unsatisfactory. It should aim at the rapid elimination of the poison and, since the primary effect of the poison is paralysis of the respiratory center, artificial respiration should be tried in cases of severe poisoning.

Among the problems that remain are the chemical identification of the poisonous principle and the discovery of simpler methods of determining when certain shell-fish are toxic.

Current Comment

GEORGIA WARM SPRINGS FOUNDATION, INC

Many letters are being received from subscribers requesting information concerning the Georgia Warm Springs Foundation, Inc. The foundation is a membership corporation organized on a basis which is known as "non-profit," under the laws of the state of New York. The foundation maintaining the institution at Warm Springs and the Office of Coordination at 50 East Forty-Second Street in New York City have been supported by funds from three sources: (1) revenue received from patients who are able to pay for their treatment, (2) a part of the proceeds of the Birthday Celebrations and (3) private contributions. The Georgia Warm Springs Foundation is not an endowed institution. About 110 beds are available in the Warm Springs institution, one half of them devoted to people who are able to pay the full cost of their treatment, one fourth for those able to pay a part of the cost of their treatment and one fourth for those unable to pay anything whatever toward their treatment. Thus some patients are admitted who are unable to pay any part of their cost and some are treated for part pay. The regular rates of the institution indicate a basic weekly payment of \$22, which includes supervision, physical therapy in the pools, the services of the various attendants and walking instruction. Not included and charged for as separate charges are the fees for the initial examination of every patient made

by the attending physician on arrival, orthopedic appliances such as braces, shoes and corsets, wheel chair rental (at 25 cents a week), extra surgical care and an education fee for children in the schools varying from \$5 a week for the lower grades to \$1 an hour for the higher grades. The charge for maintenance varies from \$17 to \$30 a week per patient, and special attendants are charged for at rates of from \$15 a week to \$30 a month. Persons who visit the institution to be with relatives and friends pay from \$25 to \$40 weekly for their accommodations. Approximately 125 employees are in attendance at the Georgia Warm Springs Foundation. The first Roosevelt Birthday Balls in 1934 netted \$1,003,000, the next \$803,000 and those for 1936 and 1937 \$353,000. Of this total \$2,159,000, according to available reports, \$809,000 was retained in the cities in which the money was raised and \$241,000 was assigned for medical research. The remainder was turned over to the Georgia Warm Springs Foundation. All the proceeds from the celebration of the President's birthday this year will be turned over to the National Foundation for Infantile Paralysis.

THE SPLEEN IN THROMBO- CYTOPENIC PURPURA

Troland and Lee,¹ working in the Department of Surgery of the Johns Hopkins University School of Medicine, have found, according to a report just published, that the spleens from three patients with thrombocytopenic purpura contained a substance which has the property of reducing the platelet count in the circulating blood of normal rabbits as much as 90 per cent. The spleens investigated were taken directly from the operating room and ground in a food chopper. To this material in a rubber sealed jar was added twice its volume of reagent acetone. The jar was shaken occasionally for several days, after about two weeks the supernatant fluid was filtered away and the acetone distilled off, leaving a small amount of a thick brownish material deposited on the walls of the distilling flask. After 100 cc of distilled water had been added, the flask was shaken vigorously so that as much as possible of the brown substance was taken up by the water. The filtrate, which was yellowish brown and cloudy, did not show a precipitate after standing in the icebox for weeks. Twenty cubic centimeters of the first preparation was injected into the ear vein of a rabbit. At the end of twenty-four hours the platelet count was reduced from the preinjection level of 620,000 per cubic millimeter of blood to 58,000. The count returned to normal in thirty-six hours. At the height of the reduction in platelets, the bleeding time was greatly prolonged. The extract from the second thrombocytopenic spleen produced a platelet drop from 640,000 to 20,000 in twenty-four hours and from the third from 610,000 to 100,000 in the same length of time. Later, it was found that 5 or even 3 cc would produce almost as much thrombocytopenia as the much larger amount. Repeated injections of the extract caused the platelet count to remain at about 70,000 for a period of about

¹ Troland, C. E. and Lee, F. C. A Preliminary Report on Platelet Reducing Substance in the Spleen of Thrombocytopenic Patients. *Bull. Johns Hopkins Hosp.* 62: 83 (Jan.) 1938.

nine days, and continued administration (there were only about four injections given) might have maintained this low count for a longer period. Four control extracts made in a similar manner were used (thyroid tissue, myomatous uterus, a spleen from a patient with Banti's disease and a spleen from a patient with hemolytic jaundice). Virtually no decrease in the number of platelets was noted following the injection of these respective extracts. The authors suggest the term "thrombocytopen" for the as yet chemically unidentified substance present in the spleens of thrombocytopenic patients. Obviously this fundamental observation not only establishes a scientific basis for splenectomy in persistent thrombocytopenia but also opens the way toward new studies which may abolish the use of the word "idiopathic" in such cases.

DANGERS OF SODIUM PERBORATE IN THE MOUTH

Dentists have long recognized the wholesale abuse of perborates and the attendant dangers, of which the general and medical public have been largely ignorant. The most prominent ingredient used in recent years in dentifrices and mouthwashes for antiseptic purposes is sodium perborate. This has been inspired, no doubt, by its alleged efficiency in combating Vincent's infection. Aside from the fact that its general use in self medication has often delayed the adequate care of such constitutional diseases as pernicious anemia, leukemia and scurvy, the possibilities of local harm have been underestimated. Now comes a study, based on the questionnaire method, by Isador Hirschfeld,¹ chairman of the Committee on Scientific Investigation of the American Dental Association. According to the clinical observations recorded in the questionnaires, perborate in solution, as a mouthwash in powder form, as a dentifrice, as a principal component of a tooth paste or as a powder superimposed on the tooth paste in brushing may cause (1) painful chemical burns of the oral mucosa (including the gingivae), (2) less painful or entirely painless burns producing a milky-white discoloration, especially of the marginal gingivae, (3) an inflamed condition of the oral mucosa, which predisposes the gingivae and mouth generally to ready abrasion and infection through minimal traumatization, and (4) a form of "hairy tongue" which in some instances causes gagging or irritation of the soft palate and pharynx. Ample examples of the danger of this form of self medication have now been recorded and adequate proof offered. Furthermore, it has yet to be established that the daily use of sodium perborate in any form is of any real value in the prevention of Vincent's infection or its recurrence. Once again the danger of self medication with active drugs has been shown, once again the unscientific advertising of substances properly belonging in the field of dentistry or medicine has proved a danger to health. How long must such examples be multiplied before the public receives protection from unenlightened commercialism?

¹ Hirschfeld Isador. Pathologic Conditions Associated with the Use of Sodium Perborate. Observed by Members of the American Academy of Periodontology. The Toothbrush—Its Use and Abuse. Dental Items of Interest. July 1937 p. 662. October 1937 p. 927.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Board Rules for License to Practice Amended—The Alabama State Board of Medical Examiners recently amended its rules governing the issuance of certificates of qualification to practice medicine in Alabama. After the collegiate year 1938, any applicant will be required to serve at least one year of internship before a certificate will be issued. Although the applicant will be permitted to take the examinations, the certificate will be withheld until he completes the internship. In the case of graduates of European schools, the amendments provide that the applicant must present a certified statement from the National Board of Medical Examiners of the United States stating that he has successfully passed all examinations required by the board and either present a certificate of qualification to practice medicine issued in the country of his nativity or in the country in which the medical school from which he graduated is located, or a certificate stating that he has satisfactorily passed the federal examinations necessary to obtain licensure in the country in which the medical school from which he graduated is located. The rules also provide that all foreign-born applicants shall present at least first citizenship papers.

ARIZONA

Graduate Courses on Maternal and Child Welfare—The Arizona State Medical Association and the state board of health are cooperating in a series of graduate courses on maternal and child welfare for physicians throughout the state. Courses are scheduled to be held in the Santa Rita Hotel, Tucson, February 14-19, in the Adams Hotel Phoenix, February 21-26, and at Prescott in May. Drs. LeRoy A. Calkins, Kansas City, Mo., professor of obstetrics and gynecology, University of Kansas School of Medicine, and Julian D. Boyd, associate professor of pediatrics, State University of Iowa College of Medicine, Iowa City, will conduct the courses at Tucson and Phoenix.

CALIFORNIA

Another Human Death from Rabies—A postman in Los Angeles County was bitten above the left ankle by a dog about Oct. 21, 1937. Only tincture of iodine was applied. December 2 he showed symptoms suggestive of rabies and was taken to a hospital, where he died December 3. A few days before entrance to the hospital, the patient complained of pain and numbness in the hands, arms, feet and legs. Tests on brain tissue were positive for rabies. According to the *Weekly Bulletin* of the state department of health, this is the third human death from rabies in Los Angeles County since June 1937. More than 2,000 rabid animals were discovered in the state during the year and quarantines against dogs are in effect in at least two counties of the state, it was reported.

Society News—The Alameda County Medical Association was addressed in Oakland January 17, by Drs. Eugene H. Benson Jr., Berkeley, on 'Early Diagnosis of Peripheral Vascular Disease', Olin H. Garrison, 'Late Lesions in Peripheral Vascular Disease,' and Warren B. Allen, 'Cerebrovascular Accidents'.—Dr. Frank R. Ober, Boston, discussed 'Low Back Pain' before the Hollywood Academy of Medicine January 20.—The Los Angeles County Medical Association was addressed January 25 by Drs. Alfred Bielschowsky, Hanover, N. H., on 'Strabismus in Children', John O. McReynolds, Dallas, Texas, 'Ophthalmology and the General Practitioner' and Arthur W. Proetz, St. Louis, 'Treatment of Sinus Disease in the Light of Modern Knowledge'. Dr. Siegfried Thannhauser, Boston, addressed a joint meeting of the society and the internal medicine section January 20 on 'The Physiology of Liver Metabolism as a Basis for Liver Function Tests and Diet Treatment'.

CONNECTICUT

Personal—Dr. Arthur J. Couture, Moosup, has been appointed health officer of Sterling for a term of four years, and Dr. George S. Lambert has been named to a similar position in the borough of Danielson and acting health officer of Killingly.

Society News—Dr Jerome P Webster, New York, addressed the Bridgeport Medical Association December 7 on "The Application of Plastic Surgery Principles in General Surgery." Dr Louis H Nahum, New Haven, discussed coronary arteries from the clinical standpoint with especial reference to prognosis at a meeting November 9—Wendell M Stanley, Ph.D., Princeton, N. J., discussed "Isolation and Properties of Virus Proteins" before the Yale Medical Society December 8—Dr Raymond A Vonderlehr, U S Public Health Service, addressed a public meeting at the West Middle School, Hartford, February 2, on "Recent Progress in the Control of Syphilis." The lecture was under the auspices of the Hartford Board of Health.

IDAHO

Society News—Dr Ben C Eisenberg, Pocatello, addressed a meeting of the Pocatello Medical Society, January 6, on "Subacute Bacterial Endocarditis." At this meeting Dr James O Cromwell, medical superintendent of the state mental hospital at Blackfoot, appointed the following staff to attend regular meetings at the hospital and conduct clinical work. Drs Abram M Newton, orthopedics, Joseph V Clothier, ophthalmology, Casper W Pond, otolaryngology, Edward N Roberts, surgery, and Richard P Howard, internal medicine.

ILLINOIS

Convalescent Measles and Scarlet Fever Serum—A series of clinics are being held by the state department of health and the Samuel Deutsch Serum Center, Chicago, to obtain convalescent serum to combat the current near-epidemic waves of scarlet fever and measles in Illinois, according to a release from the state department. Clinics have already been held in Peoria January 27, Hillsboro February 1 and Quincy February 3. Others will be held at Moline, Kewanee, Elgin, Alton, Springfield and other places. Healthy persons more than 14 years of age who have recently recovered from measles or scarlet fever are acceptable as donors, each of whom will be paid \$5. Four fifths of the serum will be retained by the Samuel Deutsch Serum Center at the Michael Reese Hospital, Chicago, where any physician of the state can obtain either measles or scarlet fever convalescent serum at cost. The remaining fifth will be left for free local use in each community where a clinic is held. About 400 new cases of measles and about 100 of scarlet fever are being reported daily in the state, and indications are that both will continue at a high prevalence level for several weeks.

Chicago

Ludvig Hektoen Lecture—The fourteenth Ludvig Hektoen Lecture of the Frank Billings Foundation of the Institute of Medicine of Chicago will be delivered by William C Rose, Ph.D., professor of biochemistry, University of Illinois, February 25 at the Palmer House. The title of the lecture is "The Physiology of Amino Acid Metabolism."

Branch Meetings—Dr Walter C Alvarez, Rochester, discussed "Useful Hints in the Treatment of Indigestion" before the Aux. Plaines Branch of the Chicago Medical Society January 29. The South Chicago Branch was addressed January 25 by Drs David S Hillis and Philip A Daly on "Indications for Forceps" and "The Heart in Pregnancy." Dr George G Ornstein, New York, discussed "Pathogenesis of Tuberculosis and Its Prognostic and Therapeutic Implications" before the North Shore Branch February 1 and Dr Pol N Coryllos, New York, "Some of the Newer Aspects of Surgery of the Chest." At a meeting of the North Side Branch February 3 Drs Oswald H Robertson spoke on "Lobar Pneumonia, with Special Reference to Serum Therapy" and Paul S Rhoads, Evanston, Ill., "Treatment of Upper Respiratory Infections." Dr Anthony J Linowicki, as the after dinner speaker discussed "Some Impressions of Medical Practice in Russia and Poland."

INDIANA

Personal—Dr John C Glackman, Rockport, has been appointed health officer of Spencer County—C B Blakeslee, D.O., Indianapolis has been appointed a member of the state board of medical registration and examination, succeeding E O Peterson, D.O., La Porte, who recently resigned.

Society News—A symposium on sulfanilamide was presented before the Indianapolis Medical Society January 18 by Drs Gerald F Kempf, William Niles Wishard Jr and Matthew Winters. The society was addressed January 25 by Drs Joseph W Ricketts and Murray N Hadley on the diagnosis and surgical treatment, respectively, of carcinoma of the rectosigmoid.

IOWA

Scarlet Fever Most Prevalent Disease in 1937—The state department of health reported that scarlet fever with 7,860 cases was the most prevalent disease in Iowa during 1937. There were ninety-four deaths, the highest total from this cause since 1923.

Forum on Venereal Disease—The question "How Can We Conquer Venereal Disease?" was discussed in a public forum at the Hoyt Sherman Place, Des Moines, January 30. Dr Morris Fishbein, Chicago, Editor of THE JOURNAL, opened the forum with an address on syphilis. The event was sponsored by the department of adult education of the Des Moines Public Schools and Dr Harry E Ransom, health commissioner of Des Moines, in cooperation with the state department of health and the Polk County Medical Society.

KANSAS

Joint Educational Program—The Kansas State Tuberculosis and Health Association at a meeting December 30 agreed to join with the committee on control of tuberculosis of the Kansas Medical Society and the state board of health in sponsoring an educational program on tuberculosis. The tuberculosis association will contribute \$600 toward financing the program, according to the state medical journal.

Society News—At a meeting of the Labette County Medical Society in Parsons, December 22, Dr James T Narmore, Parsons, spoke on mental diseases and Dr Edgar C Duncan, Fredonia, medical organization—Dr Frank L Feiershend, Kansas City, Mo., discussed "Skeletal Traction as a Therapeutic Measure" before the Butler-Greenwood County Medical Society at El Dorado December 10—The Cowley County Medical Society was addressed at Arkansas City December 9 by Dr Grover G Whitley, Douglas, on "The Butler County Plan."—At a meeting of the Golden Belt Medical Society in Abilene, January 6, the speakers included Drs Brian B Blades, St Louis on "Thoracic Surgery" and Archibald J Brier, Topeka, "Photography in Medicine."—The Meade Seward County Medical Society is showing a series of lay educational motion pictures. The first, on hernia operations was shown January 7 at the Liberal High School with Dr Albert L Hilbig, Liberal, in charge of the program. Appendix operations will be the subject for the February program with Dr Waldo N Lemmon in charge, the correction of crossed eyes will be shown in March under the direction of Dr William T Grove.

KENTUCKY

Society News—Drs George Ezra Titsworth, Bandana and Blanton E Russell, Clinton, addressed the Ballard Carlisle Hickman Counties Medical Society in Arlington, December 7, on progress of medicine and surgery in the past fifty years and epidemic meningitis, respectively—Speakers before the Jefferson County Medical Society Louisville, January 17, were Drs David Y Keith, on "The Physics of Radium Therapy," Robert L Kelly, "The Use of Radium and X-Rays in Skin Lesions," and Jesshill Love, "Results of Radium Treatment of Carcinoma of the Cervix," all are of Louisville—Dr Russell L Haden, Cleveland, delivered an address at the annual meeting of the Louisville Medico Chirurgical Society, January 14 on "Early Microscopes and Early Microscopists."—Dr James H Hendren, Pineville, addressed the Bell County Medical Society, Middlesboro, January 14, on "The Doctor Before the Jury."

MASSACHUSETTS

New England Obstetrical and Gynecological Society—Dr Bertram H Buxton, Providence, R. I., was elected president of the New England Obstetrical and Gynecological Society at its ninth annual meeting in Boston December 1. Dr Thomas Almy, Fall River, was chosen vice president and Dr John G Walsh, Providence, R. I., secretary. The program included ward visits and clinics. Among the speakers were the following, all of Boston:

Dr Max Davis, Practical Aspects of Endocrine Therapy in Obstetrics and Gynecology
Dr Edwin W. Smith, Personal Experience of the Low Cervical Cesarean Section
Dr Samuel R. Meaker, The Place of the Classical Cesarean Section
Drs James C Janney and George I. Levene, Transuterine Sterilization
Horace Z. Landon addressed the banquet in the evening on "Modern German from a Yankee Viewpoint." A prize of \$250 which was established at the 1936 meeting to be awarded annually for the best article on either an obstetric or a gynecologic subject was presented to Dr Howard V. Simpson, Waltham, for his essay on "The Role of Venous Pressure in Eclampsia."

MINNESOTA

Sentenced for Illegal Operation—Myrtle L. Brandenburg pleaded guilty January 6 in the district court of Hennepin County to an indictment charging her with manslaughter in the first degree and was sentenced to a term of from five to twenty years at hard labor in the women's reformatory at Shakopee. Mrs. Brandenburg, who holds no license to practice any form of healing in Minnesota, performed a criminal abortion on a 27 year old married woman who died from the effects of the abortion Nov. 23, 1937. She admitted having performed other abortions, stating that she received \$25 apiece for a few of them but that most of the time she received from \$5 to \$10 for each abortion.

Society News—Dr. J. Henning Waldenstrom, Stockholm, Sweden, gave a lecture at the Mayo Clinic, Rochester, under the auspices of the Mayo Foundation January 6 on 'The Etiology of Arthritis Deformans of the Hip'.—Dr. Fremont A. Chandler, Chicago, discussed 'Response of Bone to Circulatory Changes' before the Hennepin County Medical Society January 10 in Minneapolis. The society was addressed January 12 by Dr. Wesley W. Spink on 'Streptococcal Infections', January 19, Dr. Owen H. Wangenstein, 'Management of the Undescended Testis', and January 26, Drs. Ralph T. Knight and Hamlin A. N. Mattson, 'Peridural Anesthesia' and 'Surgery of the Common Duct Stones. Recent Developments' respectively.—At a meeting of the Scott-Carver County Medical Society in Shakopee, January 11, Drs. Willard D. White and Owen F. Robbins, Minneapolis, discussed 'Treatment of the More Common Fractures' and 'Problems in Prenatal Care' respectively.

MONTANA

Twenty-Five Years as State Health Officer—Dr. William F. Cogswell, Helena, was honored at a dinner January 17 celebrating his completion of twenty-five years as health officer of Montana. Dr. Louis H. Flugman, Helena, former president of the Medical Association of Montana and of the Montana State Board of Health, presided at the dinner. Dr. Cogswell, who is 69 years of age, graduated in 1894 from Dalhousie University Faculty of Medicine, Halifax, N. S. His efforts were largely responsible for the establishment of the Rocky Mountain spotted fever laboratory at Hamilton which was later taken over by the U. S. Public Health Service.

NEW YORK

Estate Donated to Tuberculosis Society—The Saranac Lake Society for the Control of Tuberculosis received as a gift in December a large estate on the Saranac River overlooking Lake Flower. The estate consists of a house with twenty rooms, two stables, a garage and servants' quarters. It was formerly the property of John Rumsey of New York and was deeded by Harmon S. Auguste, New York, holder of a \$15,000 mortgage on the property. The society's plans for use of the gift have not been announced.

Society News—Dr. Ralph J. McMahon, Johnson City, addressed the Broome County Medical Society, Binghamton, January 11, on 'Cardiovascular Emergencies and Their Management'.—Dr. George P. Berry, Rochester, addressed the Medical Society of the County of Albany, January 26 on 'The Nature of Filtrable Viruses and Their Role in Clinical Medicine'.—Dr. Myron Metzenbaum, Cleveland, addressed the Buffalo Otolaryngological Society January 18 on 'Effects of the Normal Cartilaginous Septum on the Anatomical Development of the Nose, Jaws, Sinuses and Teeth'.

New York City

Clinical Session on Tuberculosis—The Tuberculosis Sanatorium Conference of Metropolitan New York will hold its thirteenth clinical session on chronic pulmonary diseases February 9 at Cornell University Medical College with addresses by Drs. Julius P. Dworetzky, Liberty on 'Tuberculosis of the Larynx', Emil Granet, 'Tuberculosis of the Intestines' and Clarence G. Bandler, 'Tuberculosis of the Genito-Urinary Tract'.

New York University Offers Course on Syphilis—A program of graduate study in syphilis has been arranged at New York University College of Medicine to extend from February 15 to June 15 in cooperation with the U. S. Public Health Service and the New York State Department of Health. The course is intended primarily for physicians working in state and local health departments, but other physicians may be accepted. Physicians at present engaged in health department work may apply either to the office of the dean at the

College of Medicine, 477 First Avenue, or through their state health departments. Others should apply directly to the college.

Medical Exhibits at the Fair—Fifty sections are to be included in the medicine and health building of the New York World's Fair 1939, showing menaces to man's physical welfare and safeguards against them, according to a recent announcement. The health building, which is now nearing completion on the fair site near Flushing, will be dominated by the Hall of Man. The central feature of the hall will be an eighteen foot transparent man surrounded by life size models illustrating the processes of respiration and digestion, the functions of the eye and ear and the processes of growth and reproduction. There will be individual exhibits on cancer, tuberculosis, diabetes, diseases of the blood, pneumonia, allergy, epidemiology and heart disease, sponsored by various groups and by manufacturing firms. A demonstration of the details of hospital care, including hospital administration and finance, will also be shown, with adjacent exhibits on roentgenology, anesthesia and analgesia.

NORTH CAROLINA

Foundation Provides Funds for Syphilis Campaign—Income from the \$7,000,000 Zachary Smith Reynolds Foundation will be used exclusively to finance a campaign against syphilis in North Carolina, it was recently announced by trustees of the foundation established in 1936 in memory of the late Zachary Smith Reynolds of the Reynolds tobacco family. The income will amount to more than \$100,000 a year, it was said, and this amount has already been presented to the state board of health for the first year's work. As a result of an appropriation of \$25,000 by the last general assembly, the state now has sixty-seven clinics for venereal disease in operation. The new fund will be used to expand about twelve of these in the more populous counties. A clinic on wheels, consisting of a motor truck fitted as a physician's office and accompanied by a doctor and a trained nurse, will be operated in rural districts as one of the first projects, and others will be added if one proves successful. Drugs for treatment will be supplied by the board of health in all clinics and also to physicians who cooperate in the program. Dr. Carl V. Reynolds, Raleigh, state health officer, is in charge of planning the campaign.

OHIO

Medicomilitary Refresher Course—A ten week refresher course for members of the U. S. Army Medical Reserve Corps in the fifth corps area was begun January 26 and will continue on Wednesdays to March 30 at the University of Cincinnati College of Medicine. It was announced that Percival S. Rossiter, surgeon general of the U. S. Navy, would be a guest for the course March 16.

Dr. Upham Honored—Dr. John H. J. Upham, Columbus, President of the American Medical Association, was honored at a dinner and reception given January 21 by the president and administrative council of Ohio State University to four deans in the university who are serving as presidents of national professional associations. Besides Dr. Upham, dean of the school of medicine since 1927, those honored were Harry Semans, D.D.S., college of dentistry, president of the American Association of Dental Schools, Oscar V. Brumley, D.V.M., college of veterinary medicine, president of the American Veterinary Medical Association and Herschel W. Arant, LL.B., college of law, president of the American Association of Law Schools.

Industrial Hygiene Survey—The bureau of occupational diseases of the state department of health is to direct a survey of Ohio industries to obtain information concerning health conditions of workers, *Ohio Health News* announces. An average random sample of manufacturers, of the mechanical and mining industries and of three service groups has been selected for the survey, in which the safety, medical and other welfare provisions for employees will be recorded, as well as the health hazardous occupational exposures. The surveyors and engineers selected for the work will attend a special training course at Columbus given by Mr. J. J. Bloomfield, safety engineer of the U. S. Public Health Service, before undertaking their investigations.

Society News—The Public Health Federation of Cincinnati celebrated its twentieth anniversary at a dinner December 15, with Dr. William A. O'Brien, associate professor of pathology and preventive medicine and public health, University of Minnesota Medical School, Minneapolis as the guest speaker. 'Advances in Medicine During 1937' were reviewed at a meeting of the Montgomery County Medical Society, Dayton February 4 by Drs. Harry E. King, Sherl J. Winter and Elias C. Fischbein.

PENNSYLVANIA

Society News—Drs William J Fetter and Mark M Bracken, Pittsburgh, addressed the Westmoreland County Medical Society, Scottsdale, January 25, on "Early Diagnosis and Treatment" and "Typing of Pneumococci" respectively.

Obstetric Institute—The second annual institute in obstetrics and pediatrics of the Dauphin County Medical Society, arranged by the maternal and pediatric welfare commission of the state medical society, was held at the Harrisburg Academy of Medicine February 2. The speakers on obstetric subjects were Drs Newlin F Paxson, Harry Stuckert and John C Hirst, those on pediatrics, Drs John C Gittings, Milton Rapoport and Edward S Thorpe, all of Philadelphia.

Philadelphia

Dr Henry H Donaldson Dies—Henry Herbert Donaldson, Ph D, professor of neurology, Wistar Institute of Anatomy and Biology, died of pneumonia January 23, aged 80. A native of Yonkers, N Y, Dr Donaldson was educated at Yale University and at Johns Hopkins University, from which he received his doctorate in 1885. He taught for several years at Johns Hopkins and at Clark University, Worcester, Mass., and from 1892 to 1906 was professor and head of the department of neurology at the University of Chicago. During the first six years of the latter period he was dean of the Ogden Graduate School of Science at Chicago. He was appointed to Wistar Institute in 1906. Dr Donaldson was a member of numerous scientific organizations and had served as president of the American Association of Anatomists (1916), the American Society of Naturalists (1927) and the American Neurological Association (1937). In 1895 he published a book on "Growth of the Brain" and in 1915 one on "The Rat, Data and Reference Tables." Yale University honored him with the honorary degree of doctor of science in 1906 and Clark University in 1937. In 1932 the June issue of the *Journal of Comparative Neurology* published at the Wistar Institute, was dedicated to Dr Donaldson in honor of his seventy-fifth birthday.

Pittsburgh

Society News—At a meeting of the Allegheny County Medical Society January 18 the speakers were Drs Yale D Koskoff, on "Acute Spinal Epidural Abscess," William J Fetter, "Hyperthyroidism," Henry M Ray, "Application and Interpretation of Clinical Laboratory Procedure to the Daily Problems of General Practice," Cornelius C Wholey, "Psychic Dissociations Peculiar to Major Hysteria," and Ford M Summerville, Oil City, "Injuries and Repairs of the Brachial Plexus and Nerve Supply of the Arm."—Drs James O Wallace and William A Bradshaw addressed the Pittsburgh Academy of Medicine, January 25, on "Fractures of the Cervical Spine" and "Exudative Esophagitis—Medical and Surgical Treatment" respectively.

TENNESSEE

Mid-South Post Graduate Assembly—The fifty-third annual session of the Mid-South Post Graduate Assembly will be held in Memphis February 15-18 at the Hotel Peabody under the presidency of Dr Carl R Crutchfield, Nashville. Among the speakers will be

- Dr Louis A Buie Rochester Minn. Diseases of the Anus and Rectum. Diagnostic and Therapeutic Aspects.
- Dr Joseph E Moore Baltimore Public Health Implications of the Treatment of Syphilis.
- Dr James H Means Boston Treatment of Some of the Commoner Medical Emergencies.
- Dr Albert Graeme Mitchell Cincinnati Commonplace Endocrine Problems of Childhood.
- Dr Harvey B Stone Baltimore Further Reports on Cross Grafting of Endocrine Glands.
- Dr Gabriel Tucker Philadelphia Cancer of the Larynx Its Management and Its Relation to Benign Tumors of the Larynx.
- Dr Esmond R Long Philadelphia Types of Pulmonary Tuberculosis and Factors in the Spread of Disease.
- Dr Sidney D Kramer New York An Evaluation of a Number of Procedures Recommended for Prevention of Poliomyelitis.
- Dr Russell L Haden Cleveland Treatment of Anemia.
- Dr Ramon Castroviejo New York Surgery of the Cornea.
- Dr George W Kosmick New York Favorable and Unfavorable Results from the Practice of Certain Modern Obstetric Trends and Procedures.
- Dr Alexis F Hartmann St Louis The Use of Sulfanilamide in the Treatment of Infections.

HAWAII

Epidemic of Measles—The Territory of Hawaii recently experienced the severest and most virulent epidemic of measles in its recorded history, according to *Public Health Reports* December 17. The last previous outbreak of measles in Hawaii occurred in the spring of 1932 and was followed by a period of four years of unusually low prevalence, when the number

of reported cases averaged less than ten per month. In October 1936 sixty-seven cases were reported in November 384 and in December 1,289. The epidemic reached its peak in March 1937, when 2,558 cases were reported. The number of reported cases from November 1936, when the epidemic first started, until September 1937, when it was practically over, equaled the number reported during the preceding twenty years. The outbreak was accompanied by a high mortality, the number of deaths from measles during the first three months of 1937 exceeding that from any cause except heart disease and pneumonia, the respective rates per hundred thousand of population were 102, 110 and 125. For the first six months of 1937 the rates were 81 for measles, 101 for pneumonia and 118 for heart disease. The epidemic had decreased so that the death rate for the first nine months was 55.

PHILIPPINE ISLANDS

University News—Dr Eugenio B Hernando, director of the bureau of health, Manila, has given to the medical library of the University of the Philippines a collection of medical books and journals reported to be worth 10,000 pesos.

GENERAL

Documentation Institute Selects Director—Mr Cuthbert Lee, New York, has been chosen the first director of the American Documentation Institute, established in March 1937 for the production of microfilms of scientific literature. Mr Lee is a graduate of Harvard University and has recently been engaged in banking and publishing activities in New York. He is the author of a history of early American portrait painters. As director of the institute he will have charge of the operating activities, which include microfilming in the library of the Department of Agriculture, the Library of Congress and the Army Medical Library at Washington, D C, and the distribution of research results through the medium of microfilm in cooperation with scientific and scholarly journals. The institute is a nonprofit organization with a membership nominated by about fifty societies, institutions and agencies. It has now taken over the activities of microfilming initiated by the documentation division of Science Service, which began in 1934 with literature in the Department of Agriculture and have been extended to the Library of Congress and the Army Medical Library within the past few months. The institute will not design or distribute apparatus, but for a limited time Science Service will distribute the reading machine. Financial support for development of the institute has been extended by the Chemical Foundation and the Rockefeller Foundation. Watson Davis, director of Science Service, is president of the institute.

Changes in Status of Licensure—The Kansas Medical Board of Registration and Examination announces the following:

Dr James Louis Ransom Topeka license restored December 14.

The Indiana State Board of Medical Registration and Examination reports the following:

Dr George H Espenlaub Evansville license revoked November 16 for his conviction of assault and battery with intent to commit a felony.

The Alabama Board of Medical Examiners reports the following:

Dr Sidney J Burnum Scottsboro license revoked October 29 for violation of the Harrison Narcotic Act.

The New York State Board of Medical Examiners recently reported the following action:

Dr Everett H Winter whose last known address was 184 Hillside Avenue Hollis Long Island N Y license revoked.

Bequests and Donations—The following bequests and donations have recently been announced:

University of Cincinnati College of Medicine \$20,000 by the will of Miss Rebecca Scarborough. Half the income is to be used for the department of general surgery and half for the department of internal medicine.

Nine public institutions will receive about \$717,000 by the will of Robert James Eidtitz on the death of his widow. Presbyterian and New York hospitals are to receive one fifth each of this amount. Roosevelt Hospital for the Ruptured and Crippled, Cornell University and the Dobbs Ferry Hospital four sevenths of the remainder.

Jewish Hospital Brooklyn and St Anthony's Hospital Weehaven N Y \$1,000 each by the will of Mrs Blanche E Sauler.

Mansfield General Hospital Mansfield Ohio \$25,000 by the will of Richmond Smith.

Methodist Episcopal Hospital Philadelphia \$5,000 by the will of the late Melville Gambrill.

New York Skin and Cancer Hospital \$10,000 by the will of Miss Susan Stewart Miles.

Montefiore Hospital New York \$5,000 and the United Hospital Fund New York \$2,000 by the will of Solomon G Rosenbaum.

Hospital for Ruptured and Crippled \$15,000. Presbyterian Hospital \$10,000. Flower Hospital \$7,500 and Knickerbocker Hospital one ninth of the residuary estate of Miss Annie Miller. All are in New York.

Lenox Hill Hospital New York \$12,500 from the estate of the late Josephine Schumann.

Annual Radiologic Conference—The eighth annual conference of the American College of Radiology will be a joint session with the Conference of Teachers of Clinical Radiology at the Palmer House February 13. The program will follow a luncheon at 12 30 o'clock to which all radiologists and teachers are invited. Reservations should be made with the secretary, Mr Mac F Cahal, 2561 North Clark Street, Chicago. Speakers will include

Mr Cahal The Program of the Inter Society Committee for Radiology
Dr William Edward Chamberlain professor of radiology and roentgenology Temple University School of Medicine Philadelphia The Radiologists Bill for Professional Services

Following a dinner at 6 30 for teachers of clinical radiology, the following will present papers

Dr Ross Golden professor of radiology Columbia University College of Physicians and Surgeons New York Responsibility of the Radiologists in the Training of the Hospital Intern in Fluoroscopy
Dr Byrl R Kirklin, associate professor of radiology University of Minnesota Graduate School of Medicine Rochester Minneapolis and secretary of the American Board of Radiology The Responsibility of the American Board of Radiology for Setting Up and Maintaining Standards in Radiologic Education
Dr Benjamin H Orndoff professor of radiology Loyola University School of Medicine Chicago The Bedside Manner in Radiology

Northwest Regional Conference—The annual Northwest Regional Conference will be held at the Palmer House, Chicago, February 13, under the presidency of Dr Roscoe L Sensenich, South Bend Ind. The general subject of the conference will be "Medical Care for All the People". At the morning session the following program will be presented

Dr Herman M Baker Evansville Ind Preventive Medical Care as an Activity of County Medical Societies
Dr Raymond G Arveson Frederic Wis Rural Medical Care in Wisconsin
Mr Joe W Savage Charleston W Va executive secretary West Virginia State Medical Association Physical Rehabilitation of the Indigent
Dr Raymond G Tuck Pontac Mich Oakland County Medical Plan
Dr Carl F Vohs St Louis Group Hospitalization in St Louis

The Indiana State Medical Association will be the host at luncheon, at which Dr Sensenich will give his official report. In the afternoon "Medical Care for All the People" will be discussed by Drs Rosco G Leland, Chicago, director of the Bureau of Medical Economics, American Medical Association, from the point of view of the national association, Ernest E Shaw Indianapolis, Iowa, that of the state medical association, and Mr Jack Austin, Wichita, Kan., executive secretary, Sedgwick County Medical Society, that of the county society.

CANADA

Ophthalmologists Organize—The Canadian Ophthalmological Society was recently formed at a meeting in Toronto with the following officers: Drs W Gordon Matthew Byers, Montreal, president, William H Lowry, Toronto, vice president, and Alexander E MacDonald, Toronto, secretary.

Society News—Dr Sumner L Koch, Chicago, addressed the Essex County Medical Society, Windsor, Ont., November 3 on "Injuries to the Hand". Dr Thomas Francis Jr, New York, was a guest speaker at the sixth annual meeting of the laboratory section of the Canadian Public Health Association in Toronto, December 20-22. Dr Francis spoke on "The Value of Serologic Studies in Epidemic Influenza".

The Academy of Medicine of Toronto observed the semicentennial of its library at a meeting January 4. Dr Thomas Gibson, professor of pharmacology and therapeutics, Queen's University Faculty of Medicine, Kingston, Ont., gave an account of Dr John Robinson Dickson first professor of surgery at Queen's University, and showed papers and letters illustrating early history of that school. Portraits and other recent acquisitions were formally presented to the library. The academy section on anesthesia had as a guest speaker January 24 Dr William Neff, San Francisco, who spoke on "Factors Which May Influence the Amount of Bleeding During Operations under General Anesthesia, with Special Reference to Cyclopropyl". Dr Charles E Sears Portland Ore, addressed the Vancouver Medical Association February 1 on "Pathogenesis and Treatment of Vascular Hypertension".

FOREIGN

Congress on Rheumatism—The International Congress on Rheumatism and Hydrology, convened by the International Society of Medical Hydrology and the International League Against Rheumatism will meet in Oxford England March 25-31, under the presidency of Sir Farquhar Buzzard, regius professor of medicine at Oxford. The main subjects of discussion will be "Wet and Dry Climates and Weather in the Causation of Disease" and "Juvenile Rheumatism". Inquiries concerning the congress may be addressed to the General Sec-

retary, 109 Kingsway, London, W C 2. Immediately after the international congress will be held the Bath Congress on Chronic Rheumatism to commemorate the bicentenary of the Bath Royal National Hospital for Rheumatic Diseases, March 31 to April 3.

Government Services

Study of Pilot Fatigue

The bureau of air commerce has requested the Aero Medical Association of the United States to appoint a special committee to begin a study on pilot fatigue. According to the *Journal of the Florida Medical Association*, Dr Ralph N Greene, Coral Gables, now medical director of Eastern Air Lines and medical consultant for Pan American Airways, has been appointed chairman of the committee.

Second Year Internships in Public Health Service

The U S Public Health Service announces that it will receive applications for positions as second year interns for appointment on or after July 1 or sooner if there are vacancies. Physicians are eligible who are not over 30 years old and who have or will have completed one year's internship following graduation at an approved hospital by next June. No written examination will be required. Candidates appointed for duty at marine hospitals or at U S narcotic farms will receive a gross pay of \$1,800 a year, from which a deduction of \$690 will be made if quarters, subsistence and laundry are furnished. Those assigned to federal penal and correctional institutions will receive \$1,620 a year, from which \$240 will be deducted if quarters, subsistence and laundry are furnished. Quarters, subsistence and laundry will be furnished in every instance when they are available. The quarters for an intern are designed for the use of the individual himself and cannot be shared by dependents. Appointments will be made with the understanding that opportunity will be afforded to take the next examination provided for appointment as assistant surgeon in the regular corps of the service. Persons wishing to apply should communicate at once with the surgeon general, U S Public Health Service, Washington, D C, stating definitely that they are interested in a second year internship and giving the earliest date of their availability.

Examination for Regular Corps, U S Public Health Service

An examination to establish eligibility for appointment in the regular commissioned corps of the U S Public Health Service in the grade of assistant surgeon is announced. The board of examiners will convene at the following places and times to make physical examinations and to conduct the oral and general fitness part of the examination:

U S Marine Hospital Boston February 23
U S Marine Hospital New Orleans March 2
U S Marine Hospital St Louis March 6
Colorado Psychopathic Hospital Denver March 8
U S Marine Hospital San Francisco March 10
U S Marine Hospital Seattle March 14
U S Marine Hospital Chicago March 18
U S Marine Hospital Cleveland March 21
U S Public Health Service Hospital Lexington Ky March 22
U S Public Health Service Building Washington D C March 23

Candidates should arrange to appear before the board at any of these places at 9 a m on the dates specified. Those who pass the first portion of the examination will be permitted to participate in the written portion beginning March 30 at the place where the physical examination is conducted or at some other nearer point, or candidates may elect to go to Washington March 28 and take the entire examination. The first part of the examination will consume one or two days while the written and clinical portions will consume not less than five. Any travel expenses must be defrayed by the candidate. Applicants must not have passed their thirty-second birthdays on the date the examination is taken. Must be citizens of the United States, must be graduates of class A medical colleges and must have completed at least one year of internship or its equivalent since graduation. Application blanks may be obtained by writing to the surgeon general, U S Public Health Service, Washington, or they may be obtained from the board at the time the applicant appears for examinations. Applicants will be required to present their diplomas to the board.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan 8, 1938

Breathing Exercises in Treatment of Asthma

In the report of the Asthma Research Council, just issued, the results of treatment by breathing exercises at King's College Asthma Clinic are described. These are carried out under the direction of Dr J L Livingstone and are the only form of therapy that is being investigated from the research point of view. Dr Livingstone holds that it is a mistake to call the distended lungs of chronic asthma emphysematous, as true emphysema depends on degeneration of the elastic tissue, which does not occur. The object of treatment is to restore the chest to normal size and prevent distention from occurring. Ordinary breathing exercises, the object of which is to increase the expansion of the chest, are useless. If an asthmatic patient is told to breathe deeply, his respiration seems almost entirely upper thoracic, the lower part of the chest is already fully expanded and remains immobile, the diaphragm being used only to a slight extent. The exercises are designed to teach the patient first to use the lower part of the chest as well as the upper and secondly to use the diaphragm more. They are mainly expiratory and the patient assists expiration by pressure with his hands on the lower part of the chest. The results obtained at the Asthma Clinic are as follows. In about 40 per cent of the cases the asthma has either disappeared or become so slight as not to inconvenience the patient. In about 30 per cent the condition is much improved and there remain some 30 per cent of failures, but in about half of these there has been failure to learn to breathe properly, either because the patients cannot pick up the knack or because they will not make enough effort. The patients have been carrying on in their usual environment and have not avoided feathers, dust or foods, to which they may be sensitive. A new edition of Dr Livingstone's "Physical Exercises for Asthma" has been published and a special section for children has been added.

The Fauna of Filter Beds

In his annual report to the Metropolitan Water Board, Lieut-Col C H H Harold, director of water examinations, describes two noteworthy discoveries. In the filter beds of the London water supply considerable numbers of the blind well shrimp *Niphargus aquilex* have been found. This is an amphipod related to the common fresh-water shrimp, from which it differs in absence of eyes. It is adapted to a subterranean existence and, like other animals which live in the dark, is devoid of pigment. Where it came from originally is a matter of conjecture, but it is clear that it has become adapted to the unnatural environment of the clear water channels of filters. Associated with *Niphargus* were two species of Copepods. Another amphipod discovered is *Eucrangonyx gracilis*, the scientific interest in which is increased by the fact that it has previously been recorded only in the United States and Canada. It has much the same bleached appearance as *Niphargus aquilex* but has well developed black eyes. The problems raised by these discoveries do not admit of easy solution. It is clear that a well established fauna has to be dealt with. If attacked from below it can escape into the upper levels of the ballast. The application of chloramine was only partially successful in eliminating *Niphargus*.

The Need for an X-Ray Museum

In a letter to the *British Medical Journal* Dr Douglas Webster (radiologist) refers to the signs of much activity on the part of radiologists, as shown by the flourishing condition of the British Institute of Radiology, the high attendance at

the new Section of Radiology of the Royal Society of Medicine and the new British Association of Radiologists, which is about to hold examinations for a higher qualification in radiology than is represented by the diploma, and the new Society of Radiotherapists, which holds frequent and well attended meetings. But a central x-ray museum is a great want. Most large hospitals have their own local museum collections in radiology as in other subjects. A large central museum would correspond to the surgical museum of the College of Surgeons, but years would be required for such a collection to be formed. Special endowment of some existing body, such as the British Institute of Radiology or the British Association of Radiologists, would in time attain such an end. It would be a great help to teaching the subject to have under one roof a museum representative of radiology in all its aspects—historical, technical and normal varieties, with typical illustrations, clinical, pathologic and radiologic, of the various diagnostic and therapeutic uses of radiology.

Rehabilitation of the Injured

A joint committee of the British Medical Association and the Trade Union Congress has presented an important memorandum of evidence to a committee on the rehabilitation of persons injured by accident. The conclusion of the committee of the British Medical Association on fractures is first quoted: "Excellent primary treatment is of little value in many fractures unless it is followed by a phase of active exercise directed to a complete restoration of function." The memorandum next states that in the treatment of bone and joint injury a period of immobilization is almost invariably necessary, although modern methods have shortened this. At present the only method of treating the resultant joint stiffness and muscle wasting in common use is the general physical therapy of hospital massage departments. The word "rehabilitation" may be taken as applicable to the stage between the completion of the massage and exercises and the point when heavy work can be undertaken. It is difficult to ensure the necessary procedures. The surgeon has reached the limit of his facilities. He knows that in many cases graduated light work is necessary, but it is rarely available. He generally has none to offer and, as he is generally insured, is without personal interest in recovery.

The joint committee therefore recommends that rehabilitation centers should be established where physical and mental redevelopment can be achieved by games, gymnasium exercises, the swimming pool and graduated work. Group exercises, with their friendly rivalry, are more valuable than individual efforts. Occupational activities, such as the use of simple tools, lathes, belt conveyers and drilling machines, should be available. As far as possible the work should be creative. In many cases the disability may be both mental and physical and the treatment outlined would help both. But patients who have suffered profound mental disturbance, with negligible physical disability, who are the victims of traumatic neurasthenia or functional disorder, are in an entirely different category. Under no circumstances should they be treated in the ordinary rehabilitation center. If the necessary treatment is not available in general hospitals, special organizations should be established independent of the rehabilitation centers.

An essential of success in the rehabilitation centers is the personal contact between the medical superintendent and the patients. They require varied handling. One needs sympathy, another encouragement. Some must go slow, others quickly. One requires simple example, another exhortation and stimulation. The optimum size of a unit in charge of one medical superintendent is about fifty men, the most capable superintendent cannot supervise more than 100. The unit accommodating fifty patients would deal with about 600 in the year, which is the anticipated number from a fracture clinic dealing with 2,500 injuries. It could serve an industrial area with a population of a quarter of a million. The superintendent should have

some knowledge of orthopedics and traumatic surgery but need not be an expert surgeon. He would require special training for his work. He should have first hand knowledge of the works and the various trades and occupations in the area served by the center. There should also be a gymnasium instructor and a workshop foreman. One masseur could undertake the necessary treatments for a unit of fifty patients. An employment officer would also be required. He would maintain contact with the patient's trade union and employer and with the employment exchange. He might be able to assist during the first trial of work in giving the necessary encouragement and stimulation. The patients should live at the center. This would help them to acquire a new outlook and remove them from the harmful influence of well meaning but overindulgent relatives and friends. It is suggested that the capital cost should be borne by the government and the running costs by employers for their injured workmen.

Midwifery Service for London

The London County Council brought into operation January 1 a new domiciliary midwifery service. Every mother, irrespective of her financial circumstances, will now be able to call on the service of a qualified midwife to act as such or, if a private physician is engaged, as a maternity nurse. The full fees proposed to be charged are \$10 for the first confinement and \$7.50 for the subsequent ones or for maternity nursing. Reduced fees will be charged when the patient or liable relatives are unable to pay the full fees and, when circumstances justify, the whole fee will be remitted. Over 160 midwives will be employed under the scheme. The midwives will be encouraged to make the fullest use of the various maternity and child welfare services.

Supply of Oxygen in Hospital by Pipe Line

In the Westminster Hospital, which is being rebuilt, a new method of conveying oxygen—by pipe line—has been installed. The oxygen will be supplied to points in the wards throughout the hospital and to the operating theaters. It is claimed that this new method is both more efficient and more economical than the old one.

PARIS

(From Our Regular Correspondent)

Jan 8, 1938

Efforts of the Profession to Take Over Public Health Work

During the past year the medical profession of Paris has been making an intensive study of whether general practitioners should take charge of all preventive medicine matters except those incident to epidemics. This study was undertaken with the idea that something must be done to prevent further inroads on private practice by medical representatives of the government, whose aim has been to make all physicians state officials and thus to socialize medicine. In the journal *Mouvement sanitaire* for September 1937 the entire question of whether preventive medicine should be assigned to practitioners or to government officials is discussed. From the standpoint of remuneration the practitioner would have little to gain, since the work of a public health official is poorly paid. The only advantage, according to Dr Dupuy, an inspector of hygiene, who is the author of the article, is the moral effect on the practitioner, who will feel that he is not being made a state official. The profession forgets, however, that every practitioner's work in preventive medicine will necessarily be controlled by public health officials. The representatives of the profession maintain that better work will be done by the general practitioner because he is more familiar with the family history of every patient. The latter will also be better satisfied because he can choose his medical attendant instead of being obliged to go to some one designated by the government. Dr Dupuy

states that the poorer classes, who really have need of preventive medicine, change their medical attendant frequently, so that it will be difficult to keep track of them. The practitioner, when he is busy, is apt to neglect his preventive medicine duties, which have become highly specialized knowledge. Another objection is that the general practitioner will have little opportunity to enforce his recommendations, whereas the public health officer can do so.

In answering these objections to the profession at large assuming preventive medicine duties, Dr Jean Mignon, in the Nov 17, 1937, issue of *Concours médical*, states that only practitioners who have taken special courses qualifying them for preventive medicine work should be selected and not every general practitioner indiscriminately. An arrangement could be made exempting the practitioner from surveillance by public health officers, so that violation of professional secrecy would be excluded.

To those unaware of the inroads which state medicine has made on private practice, this question of assigning preventive medicine work to the general practitioner may seem unimportant. The question of aiding those whose work is confined to their duties as family physicians is being actively discussed here and every effort is being made by the syndicates who have charge of public relations for the profession to devise some method of conserving at least a little for the general man from the efforts of the government to socialize medicine.

Vaccination Against Diphtheria and Tetanus

The October 1937 issue of the *Annales de médecine* contains three articles by Professor Ramon of the Pasteur Institute of Paris. The first is on diphtheria toxoid and the prophylaxis of diphtheria, the second on tetanus toxoid and vaccination against tetanus, and the third on associated vaccinations. The conclusions of the first of these are that the diphtheria toxoid, or anatoxin, as it is termed here, is prepared as the result of the action of heat and formaldehyde on the specific toxin. It is a stable, nontoxic vaccine the antigenic properties of which are easily demonstrable in vitro. It is capable of producing the appearance and development of an active and durable immunity in human beings. Its application all over the world to millions of persons has proved the efficacy of the diphtheria toxoid. Its routine employment bids fair to cause diphtheria to disappear almost entirely as an acute infectious disease. Wherever its use has been made obligatory there has been a marked decrease in the morbidity and mortality rate.

The conclusions of the second paper are that the use of the tetanus toxoid is especially indicated during peace time among agricultural workers, and during war it should be associated as a prophylactic measure with the vaccination against typhoid, paratyphoid and diphtheria.

The Volkmann Syndrome in Supracondylar Fractures of the Humerus

A Paris surgeon, Dr Jacques Lecomte, has made a study in ten cases of the effects of contusion of the brachial artery in supracondylar fractures of the humerus. In a paper read at the Dec 1, 1937, meeting of the Académie de chirurgie he divided the cases into two principal types, the complete in which there is immediate paralysis of the muscles of the forearm and hand, and the incomplete in which the motor disturbances appear less marked at the onset.

In the complete type, all the muscles of the forearm and hand are paralyzed and there is coincident anesthesia of the fingers, hand and part of the forearm. The median, ulnar and radial nerves show signs of degeneration. Between the forty-fifth and the sixtieth day, retraction of the flexor muscles is to be noted, whereas the sensory disturbances and evidences of paralysis of the radial nerve disappear, resulting in the typical change in position of the fingers. The muscles supplied by the

ulnar and median nerves recover their function much more slowly and this takes place only in cases in which the termination is favorable. The author has found that the sclerosis which is responsible for the muscular retraction disappears more or less completely in the majority of cases. The prognosis depends above all on recovery from the ulnar and median nerve lesions.

The incomplete type is particularly characterized by lack of involvement of the extensors of the fingers, that is to say, of the muscles supplied by the radial nerve, hence the finger deformity is noticeable from the onset instead of appearing late as in the complete type. The prognosis of these incomplete types is much more favorable, recovery having occurred in two of four cases in less than four months, two others being still under observation but apparently following the same course as those in which recovery occurred.

The lumen of the brachial artery close to the bend of the elbow is almost invariably found to be obliterated, but there is such an ample collateral circulation that gangrene of the forearm and hand does not take place. The median and ulnar nerves appear intact on gross examination, but the author found in one case that one of the large branches revealed, on microscopic study, complete destruction of the nerve elements. It is this serious involvement of the nerve trunks which distinguishes the complete from the incomplete type. Microscopic study of the muscles in both types reveals areas of necrosis in some and extravasation with beginning fibrosis in others. There appears to be complete blocking of the capillaries. All these lesions predominate in the flexor muscles of the forearm. In general it may be said that both muscular and nerve lesions can disappear but that everything depends on the severity of the latter.

In the discussion, Dr Etienne Sorrel said that but little progress had been made in the pathogenesis of the Volkmann syndrome and even less in its treatment, after the diagnosis of its existence has been made. The only bright spot is that it is possible to prevent its appearance if patients with supra-condylar fracture of the humerus are operated on as soon as possible after the injury.

Paralyses Following Antirabic Treatment

At the Dec 7, 1937, meeting of the Académie de médecine a paper was read by Dr Remlinger based on an analysis of 202 cases of paralyses following antirabic treatment, reported during the past ten years. The mortality was 32.2 per cent and the clinical pictures varied greatly. They included dorso-lumbar myelitis with or without paralysis of the bladder and rectum, ascending paralysis of the Landry type, diffuse meningo-encephalomyelitis, diverse neuritic localizations, facial monoplegia and diplegia, temporary retention of urine, and other accidents. These conditions occur most often following the use of either dried spinal cord or the latter treated with glycerin. They are especially severe after the use of diluted virus, giving rise to a type of fatal "laboratory rabies." The pathogenesis is not the result of a single action. In the mild or severe accidents due to dead vaccines, it is some component of the normal nervous substance which appears to be responsible. It is prudent to discontinue treatment as soon as any form of paralysis appears. The incidence is only 1 in 4,000-5,000 persons who are treated, hence the potential occurrence of these forms of involvement of the nervous system is not a contraindication to the antirabic treatment.

Intravenous Injections of Alcohol for Tetanus

The failure in some cases of the intensive specific serotherapy of tetanus has led Merle, François and Jouve of Clermont-Ferrand, in central France, to use alcohol intravenously on the theory that it will free the toxin that is fixed on the nervous tissue. They presented the results of the combined use of alcohol and antitoxin in ten cases of tetanus at the Dec 17, 1937, meeting of the Société médicale des hopitaux. There were

seven successful results and three deaths. In the latter, death occurred several days after cessation of the contracture in one from an infection of the gluteal region and in the other two, the patients being addicted to alcohol, from pleuropulmonary complications. The doses of serum averaged about 20,000 units a day given subcutaneously and intramuscularly because the authors regard the intraspinal route of administration as more difficult and likely to be followed by an aseptic meningitis. The alcohol was given intravenously in the form of a 33 per cent solution in 30 per cent solution of dextrose in doses of from 10 to 40 cc daily until definite improvement was noticed. No local complications were observed.

BERLIN

(From Our Regular Correspondent)

Dec 13, 1937

Congress of German Dermatologists

The principal topic of this year's congress of German Dermatologists was "The Significance of Cutaneous Tests." The first principal speaker, Frieboes, dermatologist, of Berlin, pointed out that, in the reactions observed, constitution and heredity have just as important parts as nutrition and climatic conditions. Cutaneous tests are frequently based on reactivity to several substances. Frieboes discussed the phenomenon of active acquisition of a sense of desensitization to substances which otherwise elicit hypersensitization. In the second paper, Professor Miescher of Zurich called attention to the fact that the tests must parallel the course of the disease. He differentiated, on the basis of the state of cutaneous hypersensitization, an epicutaneous and an intracutaneous type of test, corresponding to the reaction of the skin: epicutaneous in eczema, intracutaneous in urticaria. The epicutaneous reactivity is subdivided into toxic and allergic types. (The toxic reaction may be presented by the normal skin if the concentration is increased, but allergic reactions are elicited only in hypersensitive persons.) Intracutaneous hyperesthetic reactions are to be traced in part to acute vascular stimuli, in part to inflammatory processes. They also are conditioned by other factors, for example, the fluctuating power of absorption and the irritability of the sympathetic nervous system. Cutaneous tests are useful in research on the dermatoses of hypersensitization, they are unreliable, however, in the sphere of occupational disease. The tests may be helpful in vocational guidance, since they permit evaluation of the skin's power of resistance and prophylactic defense against certain noxious influences. Thus far, however, the tests have failed to establish the bases of chronic eczema and neurodermatitis. Miescher concluded his lecture with a pointed warning against unduly optimistic and uncritical utilization of cutaneous tests.

Among the numerous briefer papers, mention should be made of the report on malaria therapy of syphilis submitted by Professors Bering and Memmesheimer. These men had studied 1,400 cases of syphilis treated by this method at Cologne. The standard treatment was a minimum of eight induced febrile attacks preceded by administration of bismuth compounds and immediately concluded by administration of arsphenamine. Cases of incipient paralysis offer the most favorable prognosis. With rare exceptions improvement or complete cure was the rule in such cases. Particularly good results were elicited in incipient tabes, especially the type that is inclined to progress rapidly. Constant correspondence was remarked between the values of the cerebrospinal fluid and the clinical observations. In cases of syphilis that presented a positive cerebrospinal fluid reaction but no central nervous manifestations, the treatment nearly always rendered the reaction negative. In no case was tabes or paralysis later observed. In fully developed cases of tabes and paralysis only palliative results were as a rule obtainable.

Congress of German Gynecologists

The congress of the German Society of Gynecology was concerned chiefly with problems of the management of pregnancy and confinement. Also the care of the new-born infant and the treatment of injuries incurred by the mother during parturition were discussed. Prof. G. A. Wagner of Berlin, chairman of the congress, stressed the need of thorough courses of training for obstetricians and midwives. The congress in a formal petition requested the proper authorities to revise the present sickness insurance so that it would cover all unusual complications of pregnancy, miscarriages, premature births, antepartum and postpartum incidents and so on. The gynecologists would like to have all complicated pregnancies and confinements underwritten by the sickness insurance clubs, even to costs of hospitalization.

The first main report was read by Professor von Jaschke of Giessen on "Heart Disease and Gestation." In his opinion the pessimistic attitude toward the gravida affected with heart disease is unwarranted. Cardiac decompensation alone is not an indication for interruption of pregnancy. Decompensation manifested early in pregnancy by a patient with chronic heart disease should be considered an extremely unfavorable sign only if the woman is kyphoscoliotic.

Other papers dealt with the operative treatment of prolapsed female genitalia and with the care of the new-born infant.

Hospital and Home Confinements

The question of hospital confinements and home confinements has been much discussed in Germany of recent years. The National Bureau of Statistics has just released new data on the subject. Whereas previously statistical reports were

Distribution of Obstetric Cases in Institutions

	Total Obstetric Cases Admitted to Institutions	Cases Hospitalized in Special Institutions	Percentage Admitted to Special Institutions
Confinements	321 310	248 038	77 4
Interrupted pregnancies	4 151	1 900	46 9
Miscarriages	87 182	33 422	38 3

based on a limited number of special obstetric institutions and services, the new (1935) figures are based on the records of confinements in all institutions for the sick in Germany. The distribution of the obstetric cases admitted to these institutions is shown in the accompanying table.

According to these figures the total number of miscarriage cases is considerably greater than would have been suspected on the basis of the less comprehensive reports of previous years. In 1935 the number of births (including stillbirths) in all German institutions for the sick was 325,875 (251 2 per thousand births). This means that in 1935 every fourth new-born baby was delivered in an obstetric or other institution. The proportion of institutional confinements to the total number of births exhibits marked regional differences within the reich. In the larger cities many confinement cases are hospitalized in the absence of any particular need or prophylactic purpose. On the other hand it still happens, especially in the poorer rural districts, that the hospitalization of an urgent case will for one reason or another be delayed.

Radium Therapy of Carcinoma of Larynx

The usual therapeutic approaches to cancer of the larynx have been surgery and roentgen irradiation. Another procedure, the application of radium in conjunction with laryngeal fenestration, is worthy of special study both on account of its relative technical simplicity and because the results have thus far been favorable, especially with regard to restoration of laryngeal function. Prof. A. Hermann of Erfurt recently discussed this procedure. Favorable outcome, he says, is predicated on careful selection of suitable cases. Only unilateral

circumscribed carcinomas that have not metastasized to any glands are suitable for this type of therapy. The technic of procedure is as follows. After unilateral removal of the ala of the thyroid cartilage, a flat radium container is brought as near as possible to the affected side of the larynx and kept there for several days. The author recommends the use of small quantities of radium and an irradiation time of from 1,300 to 1,400 mg. hours. Larger doses sometimes result in damage to the cartilage, smaller doses have been proved inadequate and are followed by recidivation. To avoid any complication of wound healing, such as secondary infection or cartilaginous necrosis, it is recommended that the ala of the thyroid cartilage of the diseased side be as completely obliterated as possible and careful and constant asepsis maintained. In case the irradiation with radium is followed by recidivation, radical surgical intervention may still be attempted.

Treatment of Diphtheria Bacillus Carriers

Heretofore, attempts to render temporary carriers and constant eliminators of the diphtheria bacillus negative for the organism have been directed against the bacillus itself. Prof. Werner Catel, Leipzig ordinarius in pediatrics, has devised a new procedure. He sought to effect an increase in the defense mechanisms of the mucosa by administration of vitamin A, which substance is reputed to possess epithelium-protective properties. To this end ten drops of a vitamin A preparation (Vogan) were administered orally thrice daily and one drop in each nostril also thrice daily. This medication was maintained for ten days. To be considered successful this therapy must result in a rapid disappearance of the bacilli of diphtheria from the mucosa and the erstwhile carrier must remain permanently free from the organism. Catel's end results were as follows. Of thirty-four temporary carriers and constant eliminators of the bacillus, twenty-nine (85 per cent) became negative within ten days, many within the first few days. Of the five persons still showing positive cultures after ten days' treatment, four became negative on discontinuation of the preparation. In follow-up observation by means of repeated studies of smears, most of which were carried on over several weeks, twenty-one persons remained negative, in seven others an occasional smear was positive for the bacillus. After a greater period the smear studies in these cases, too, became negative.

Finally, one of the six persons who remained positive for the bacillus was rendered free from it by a repetition of the treatment. In fine, 65 per cent of temporary carriers and constant eliminators were permanently rid of the organism after the initial treatment, and if one adds to this number the seven cases in which temporarily a positive smear was observed after the initial treatment, the percentage of cure is 82. Only those persons were selected for the experiment who were known to have carried the bacillus of diphtheria for at least two weeks, in fact, in some instances for several months.

Prof. Erich Lexer Is Dead

Prof. Dr. Erich Lexer, for many years ordinarius in surgery at the University of Munich, died December 4, aged 70. Lexer studied for many years under Ernst von Bergmann in Berlin and in 1904 was appointed director of the surgical clinic of the university in that city. Shortly afterward he was called to Koenigsberg as ordinarius and subsequently he served in the same capacity at Jena and at Freiburg. In 1928 he was appointed to succeed Sauerbruch at Munich. Though Lexer rendered distinguished services to all provinces of surgery, his principal field of specialization was plastic surgery, the correction of deformities of the facies, joints and soft parts. To Lexer we owe, among other things, the valuable procedure of esophagojejunogastrostomosis which has gained recognition in the United States. In addition to works on plastic surgery, Lexer's "General Surgery" is well known, having already passed through twenty editions and been translated into English.

Prof Werner Korte Is Dead

Prof Werner Korte, a highly esteemed surgeon, well known both in Germany and abroad as permanent secretary of the German Society of Surgery, died December 3, aged 87. His work on the surgery of the pancreas and the biliary ducts has received general recognition.

ITALY

(From Our Regular Correspondent)

Dec 15, 1937

Society Reunion

The Societa di Anatomia recently held, at Perugia, its seventh national reunion under the chairmanship of Professor Dorello. Professor Castaldi was the speaker for the first official topic, which was "The Extrapyramidal System." He reviewed the development of the knowledge of the system and spoke on the anatomy and functions of the complicated system of nervous routes which, besides the voluntary pyramidal route, carries stimulation for the tonus and automatic movements to the peripheral organs. In the discussion, Professor Donaggio emphasized the importance of the frontal cortex in the complex of the extrapyramidal system, which theory stands in opposition to that of a prevailing importance of the corpus striatum. Professor Benari spoke on the functions of the extrapyramidal system. Professor Bertolini spoke on genetics and morphogenesis of the extrapyramidal system.

Congress of Pediatrics

The fourth International Congress of Pediatrics took place recently in Rome. It was organized by a committee of which the president was Professor Spolverini. Professors Jundell of Sweden, Glauzmann of Switzerland and Allen of the United States spoke on the first official topic, which was "Neuropsychic Diseases in Pediatrics." Professor Jundell emphasized the importance of the prevention in children of preschool age, since psychopathic conditions establish themselves at that age. The ideal place for those children is with the family rather than in institutions. It is advisable that old experienced physicians give lectures to the parents of these children on the management and education of the patients.

Professor Glauzmann said that these children have to learn social behavior and obedience even if punishment is necessary. The methods should be rational, as the wrong attitude toward the patient may affect his personality and psychic development. It is advisable to determine the psychic and somatic character of each patient in order to cope with each individual personality.

Professor Allen pointed out that, in protecting children from neuropsychic diseases, parents have to be advised on the education of their children, special attention being given to the development of a capacity for adaptation. Professor Siegl of Austria, who was the cospeaker, pointed out satisfactory results of suggestion and faradization in the treatment of neuropsychic diseases in children.

The second official topic was "Metabolism of Water and Minerals in Infants." Professor McQuarrie of the United States showed the importance of the maintenance of the equilibrium of water and of certain electrolytes in the body fluids of infants. One can imagine water in the cells as if it were in two different compartments separated from each other by means of a semipermeable membrane. Intracellular and extracellular water comprise 70 and 30 per cent respectively of the total amount of organic water. Potassium predominates in the constitution of the former, whereas sodium and chlorides predominate in that of the latter. Normally, entrance of sodium to the cells and exit of potassium from them are prevented by the cellular membrane. The walls of the capillaries are permeable to organic ions and crystalloids and impermeable to plasmatic colloids, that is proteins and lipoids. The interstitial fluid is the ultrafiltrate of blood plasma. It is the regulat-

ing agent for equilibrium between the relative constancy of the blood and of the intracellular fluids. The integrity of the semipermeable membranes has great chemical and physiologic importance. The equilibrium between liquids which are separated by membranes is ruled by Gibbs and Donnan's formula with the passage of water from lower to higher osmotic pressure. In vomiting, diarrhea and profuse perspiration, the loss of water affects first the interstitial fluids, then the blood plasma and at last the intracellular water. In diarrhea there is a loss of fixed bases with a tendency to the development of acidosis. The opposite loss takes place in vomiting. Administration of dextrose solutions prevents the development of ketosis. It is necessary to administer chlorides and some other fixed bases to infants who vomit.

Professor Csapo of Hungary said that, as children grow, the amount of intracellular water in the body increases whereas that of extracellular water diminishes. The equilibrium of water and salts in the body is disturbed in the course of diseases in infants. There may be retention of water without retention of salts or vice versa. There is a greater loss of chlorides than of sodium from vomiting. The opposite happens in diarrhea.

The third official topic was "Tuberculosis in Children." Professors Dufourt of France, Cohen of Belgium and Faltis of Greece were the speakers. Professor Dufourt spoke on the importance of ultravirus in congenital and acquired tuberculosis in infants. According to the speaker, tuberculosis is not caused by ultravirus in the three stages of tuberculosis. The ultravirus is of some significance in certain forms of curable meningitis which develop in the secondary stage of tuberculosis as well as in the attenuated forms of tuberculosis. The speaker, with Arloings' collaboration, observed the passage of tuberculous ultravirus from mother to child through the placenta. He believes, however, that ultravirus does not persist long in the child's body and does not transform into tubercle bacilli. Professor Cohen said that there are no proofs which support the theories that the filtrable elements of the tuberculous virus are normal infravisible phases of the virus and that they have pathogenic properties and different characteristics from tubercle bacilli. Professor Valtis spoke on the comparative results of intradermal reactions to tuberculin and filtrates. Patients in whom a filtrable virus could be identified reacted to filtrates but not to tuberculin in the majority of the cases. The speaker believes that the results show a probable pathogenic specific importance of a filtrable virus in tuberculosis.

Marriages

CHARLES T. CHAMBERLAIN, Fort Smith, Ark. to Miss Frances Goodlett of Nashville, Tenn., at Memphis, Tenn., January 1.

DOUGLAS HEWITT FRYER, Eutaw, Ala., to Miss Effie Irene Purdy of Toronto, Ont., Canada, in Montgomery, Ala., Nov. 3, 1937.

HENRY DAVIS CHIPPS, Corinth, Miss., to Miss Frances S. de Butts of Asheville, N. C., Nov. 6, 1937.

ROBERT PITNER LAYMAN to Miss Iris Madge Bailey, both of Knoxville, Tenn., Nov. 15, 1937.

LEON H. FELDMAN, Baltimore, to Miss Ruth Johnston of Philipsburg, Pa., Oct. 17, 1937.

JOHN HOWARD HINES to Mrs. Charlotte McCrea Floyd, both of Atlanta, Ga., Nov. 10, 1937.

JOSEPH I. BUTLER, Brooklyn, to Miss Margaret F. Kiley of Peabody, Mass., Nov. 6, 1937.

GEORGIANA J. VAN LANGERMAN, New Orleans, to Mr. W. J. Miles Jr., Oct. 16, 1937.

MILTON B. JACOBSON to Miss Dorothy Mae Kushin, both of Philadelphia, recently.

JACK LARCHIE RAWLS to Miss Elizabeth Scott, both of Bastrop, La., recently.

Deaths

Louis Adaloro Oliver Goddu * Boston, Tufts College Medical School, Boston, 1905, assistant professor of orthopedic surgery at his alma mater, member of the American Academy of Orthopedic Surgeons, fellow of the American College of Surgeons, on the staffs of Woonsocket (R I) Hospital, Boston Dispensary, New England Medical Center, Beth Israel Hospital, Malden (Mass) Hospital, Newton (Mass) Hospital, Whidden Memorial Hospital, Everett, Pondville Hospital, Wrentham, Mass, and Lakeville State Sanatorium, Middleboro, Mass., aged 58, died, Nov 11, 1937, at his home in Brookline, Mass.

Rufus Thomas Dorsey * Atlanta, Ga. Southern Medical College, Atlanta, 1897, Jefferson Medical College of Philadelphia, 1898, past president of the Fulton County Medical Society, veteran of the Spanish-American and World wars, at one time professor of clinical medicine, Emory University School of Medicine, and professor of clinical medicine and physical diagnosis at the Atlanta School of Medicine, formerly on the staffs of the Grady Hospital, Wesley Memorial Hospital and George Baptist Hospital, aged 64, died, Nov 9, 1937, of coronary thrombosis.

Charles Eastmond * Brooklyn, Columbia University College of Physicians and Surgeons, New York, 1904, member of the American Roentgen Ray Society and the American College of Radiology, fellow of the American College of Physicians, served during the World War, aged 58, on the staffs of the Norwegian Hospital, Harbor Hospital, Jamaica (N Y) Hospital, Nassau Hospital, Mineola, N Y, Jewish Hospital, Long Island College Hospital, Beth Moses Hospital and the Peck Memorial Hospital, where he died, Nov 27, 1937, of carcinoma of the bladder.

Henry Jasper Hartz, Detroit, Detroit College of Medicine, 1889, member of the Michigan State Medical Society, formerly associate clinical professor of medicine at his alma mater, member of the American Laryngological, Rhinological and Otolaryngological Society, past president and secretary-treasurer of the board of trustees of the Michigan State Sanatorium, Howell, formerly treasurer of the Michigan Tuberculosis Association, attending physician to the Detroit Tuberculosis Sanatorium, 1911-1915, aged 75, died, Nov 26, 1937.

William Joseph Lynn, Mexico, D F, Mexico, University Medical College of Kansas City, Mo, 1904, for many years served with the Canal Zone Commission in Panama, in Costa Rica was in charge of the United Fruit Company Hospital, served in the U S Army as sanitary officer in the medical corps until 1919, when he was discharged as a major, aged 55, died, Nov 12, 1937, of cerebral hemorrhage.

Orville Logan Edwards, Roodhouse, Ill., Rush Medical College, Chicago, 1914, member of the Illinois State Medical Society, served during the World War, formerly member of the city council, and for many years president of the community high school board of education, aged 51, died suddenly, Nov 23, 1937, of heart disease.

Allen Bryce Jemison, Biloxi, Miss. Vanderbilt University School of Medicine, Nashville, Tenn., 1909, at one time director of the Jefferson County (Ark.) Health Department, and in charge of the departments of epidemiology, milk control and malaria control of the state department of health, aged 51, died, Oct 29, 1937.

James Leon Lewis, New Orleans, Tulane University of Louisiana Medical Department, New Orleans, 1898, professor of clinical medicine at the Tulane University Graduate School of Medicine, aged 62, on the staff of the Baptist Hospital, where he died, Nov 17, 1937, following an operation for appendicitis.

Charles Herbert Cogswell, Pasadena, Calif. Hahnemann Medical College and Hospital, Chicago, 1866, formerly professor emeritus of obstetrics and diseases of women, State University of Iowa College of Homeopathic Medicine, Iowa City, aged 93, died, Nov 24, 1937, of acute bronchitis and broncho pneumonia.

Aubrey Michael Larsen * Surgeon Lieutenant Commander, U S Navy, retired, Los Angeles College of Physicians and Surgeons, Baltimore, 1913, entered the navy in 1917 and retired in 1933 for incapacity resulting from an incident of the service, aged 48, died, Nov 5, 1937, of bronchopneumonia and embolism.

Gaylord Lynch Hardesty, Beaver Falls, Pa. University of Pittsburgh School of Medicine, 1933, member of the Medical Society of the State of Pennsylvania, aged 33, died Nov 28, 1937, in the Beaver Valley General Hospital, New Brighton, of a streptococcal blood infection, pleurisy and pneumonia.

Theodore Swift Barnett * Potsdam, N Y, University of Michigan Medical School, Ann Arbor, 1918, served during the World War, school physician to the Potsdam State Normal School, aged 44, on the staff of the Potsdam Hospital, where he died, Nov 30, 1937, of acute pancreatitis.

Adolph Ernst Dreyer, Detroit, Detroit College of Medicine, 1903, member of the Michigan State Medical Society, veteran of the Spanish-American and World wars, aged 64, died, Nov 2, 1937, in the United States Marine Hospital, of carcinoma of the stomach with metastasis.

William Edward Fehlman, Santa Cruz, Calif., Rush Medical College, Chicago, 1906, member of the California Medical Association, served during the World War, aged 57, died, Nov 24, 1937, in the Emanuel Hospital, Portland, Ore., of an injury received in an automobile accident.

John Carey Fear, Waverly, Kan., College of Physicians and Surgeons, Keokuk, Iowa, 1877, past president of the Coffey County Medical Society, formerly mayor of Waverly and representative in the state legislature, aged 82, died, Nov 4, 1937, of pulmonary edema and arteriosclerosis.

J D Mahaney, Columbus, Ga., Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912, member of the Medical Association of Georgia, aged 49, on the staff of the Columbus City Hospital, where he died, Nov 18, 1937, of acute hemorrhagic pancreatitis and gallstones.

Garland B Couch, Phoenix, Ariz., Homeopathic Medical College of Missouri, St Louis, 1908, member of the Arizona State Medical Association and the Associated Anesthetists of the United States and Canada, aged 66, died, Nov 21, 1937, in Long Beach, Calif.

Gwen Whelpley Crawford * Bartlesville, Okla., University of Arkansas School of Medicine, Little Rock, 1930, on the staff of the Washington County Memorial Hospital, aged 30, died, Nov 23, 1937, of an injury received in an automobile accident, near Antlers.

John Michael Doran, Chelsea, Mass., Baltimore Medical College, 1907, member of the Massachusetts Medical Society, aged 53, president of the staff of the Chelsea Memorial Hospital, where he died, Nov 13, 1937, of esophageal varix and myocarditis.

Matthew Robert Blake, Winnipeg, Manit., Canada, Trinity Medical College, Toronto, Ont., 1902, M.R.C.S., England, and L.R.C.P., London, 1903, aged 61, died, Nov 21, 1937, in St Boniface (Manit.) Hospital, of hemiplegia and arteriosclerosis.

Philip Jenkins Davies * Scranton, Pa., Medico Chirurgical College of Philadelphia, 1901, served during the World War, for many years medical school inspector, on the staff of the West Side Hospital, aged 68, died, Nov 9, 1937, of angina pectoris.

James Warren Campbell, St. Louis, Mich., Victoria University Medical Department, Coburg, Ont., Canada, 1884, formerly member of the board of education, and health officer, aged 85, died, Nov 27, 1937, of coronary disease.

John M Mann, Lake Butler, Fla., Georgia College of Eclectic Medicine and Surgery, Atlanta, 1910, president of the state board of medical examiners, formerly state senator, aged 61, died, Nov 7, 1937, of cerebral hemorrhage.

Benjamin Franklin Loring, Union City, Tenn., Fort Worth (Texas) School of Medicine, Medical Department of Fort Worth University, 1895, University of Nashville Medical Department, 1902, aged 76, died, Oct 30, 1937.

Capolis L Blue, Tocsin, Ind., Fort Wayne College of Medicine, 1898, member of the Indiana State Medical Association, aged 68, was found dead, Nov 7, 1937, of angina pectoris, following shock due to an automobile accident.

Hertel Lefebvre de Bellefeuille, Montreal, Que., Canada, University of Montreal Faculty of Medicine, 1935, on the staff of St Jean de Dieu Hospital for the Insane, Gamelin, aged 29, died, Nov 8, 1937, in the Hospital Ste. Justine.

John Richard Lynas * Lieutenant, U S Navy, Long Beach, Calif., Indiana University School of Medicine, Indianapolis 1924, entered the navy in 1924, aged 38, died, Nov 15, 1937, in Shanghai, China, of diphtheria.

Franklin Marion Carter, Newport, Ore., Willamette University Medical Department, Salem, 1872, formerly physician to the Siletz Indian Reservation and superintendent of Indian schools, aged 88, died, Oct 16, 1937.

James Richard Earle, Chicago, Rush Medical College, Chicago, 1906, served during the World War, formerly connected with the U S Public Health Service reserve, aged 58, was found dead, Nov 18, 1937.

Arsene A Letourneau, Auburn, Maine, Victoria University Medical Department, Coburg, Ont., Canada, 1887, aged 74 on the staff of St Mary's Hospital, Lewiston, where he died, Nov. 1, 1937, of heart disease

Alvan Maurice Fortney, Lawrence, Kan., University of Kansas School of Medicine, Kansas City, 1908, served during the World War, aged 55, was found dead, Nov. 5, 1937, of a self-inflicted bullet wound

Joseph Wells Jackson, Barre, Vt., University of Vermont College of Medicine, Burlington, 1890, veteran of the Spanish-American War, on the staff of the Barre City Hospital, aged 69, died, Nov. 27, 1937

William Thompson Jones, Laurel, Del., University of Maryland School of Medicine, Baltimore, 1895, past president of the Delaware State Medical Society, aged 68, died suddenly, Oct. 22, 1937

James Harvey Lyon, Chicago, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1878, aged 84, died, Nov. 26, 1937, in Evanston, Ill., of arteriosclerotic heart disease

Robert Bennett Brigham ♂ Northampton, Mass., Harvard University Medical School, Boston, 1928, on the staff of the Cooley Dickinson Hospital, aged 35, died, Nov. 26, 1937, of encephalitis

Bernard McAuley Bradford, Knapolis, N. C., North Carolina Medical College, Charlotte, 1913, served during the World War, aged 47, died suddenly, Nov. 19, 1937, of coronary occlusion

Elmer E Hulsizer, Indianapolis, Central College of Physicians and Surgeons, Indianapolis, 1888, aged 79, died, Nov. 19, 1937, of hemorrhage of the bladder and cirrhosis of the liver

Arthur James Douglass, Portland, Ore., Missouri Medical College, St. Louis, 1895, aged 71, died, Nov. 12, 1937, in the Good Samaritan Hospital, of hemorrhage of the gastro-intestinal tract

Alva W. Carnes, Hutchins, Texas, Vanderbilt University School of Medicine, Nashville, Tenn., 1883, member of the State Medical Association of Texas, aged 81, died, Oct. 28, 1937

John Andrew Cooper, Philadelphia, Medico-Chirurgical College of Philadelphia, 1899, aged 63, died, Nov. 25, 1937, in the Germantown Dispensary and Hospital, of bronchopneumonia

Earle Pope Gregory ♂ Fryeburg, Maine, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1909, aged 60, died, Nov. 20, 1937, of coronary thrombosis

John Arcade Gilmore, Thomasville, Ala., Louisville (Ky.) Medical College, 1886, member of the Medical Association of the State of Alabama, aged 81, died, Oct. 25, 1937

James Thomas Farley, Lancaster, Ohio, Ohio Medical University, Columbus, 1897, member of the Ohio State Medical Association, aged 71, died, Nov. 3, 1937, of angina pectoris

Benjamin Black Wood ♂ Pittsburgh, Western Pennsylvania Medical College, Pittsburgh, 1899, aged 60, died, Oct. 28, 1937, in the Mercy Hospital, of pulmonary embolism

Thomas R. Turner, Sherman, Texas, College of Physicians and Surgeons, Baltimore, 1881, aged 83, died, Oct. 3, 1937, in the Wilson N. Jones Hospital, of coronary thrombosis

Justin Clement Williams ♂ Chicago, Northwestern University Medical School, Chicago, 1925, aged 41, died, Oct. 10, 1937, in Oak Park, Ill., of bacterial endocarditis

Walter Edward Brown, Oklahoma City, Okla. (licensed in Oklahoma under the Act of 1908) aged 68, died, Nov. 30, 1937, of an infection, following acute tonsillitis

Charles Edwin Houston, Donalds, S. C., Medical College of the State of South Carolina, Charleston, 1901, aged 59, died, Nov. 1, 1937, in a hospital at Greenwood

Rodney Dent Book ♂ Corning, Ohio, Kentucky School of Medicine, Louisville, 1892, aged 71, died, Nov. 6, 1937, in the Grant Hospital, Columbus, of pneumonia

James Lindsay Galbraith ♂ Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1890, aged 69, died, Nov. 4, 1937, of lobar pneumonia

Charles Robert Elliott, New York, Trinity Medical College, Toronto, Ont., Canada, 1901, aged 58, died, Nov. 16, 1937, in Detroit, of coronary thrombosis

George Byron Maurice, Waterville, Vt., University of Vermont College of Medicine, Burlington, 1899, aged 64, died, Nov. 30, 1937, of cerebral hemorrhage

John Richard Moore, San Antonio, Texas, Meharry Medical College, Nashville, Tenn., 1894, aged 67, died, Oct. 11, 1937, of carcinoma of the stomach

Charles Fremont Dawson, Matthews, Ind., Curtis Physio-Medical Institute, Indianapolis, 1892, aged 80, died, Nov. 27, 1937, of arteriosclerosis and prostatitis

Mortimore Silas Reynolds, Yates Center, Kan., College of Physicians and Surgeons, Keokuk, Iowa, 1890, aged 72, died, Oct. 26, 1937, of angina pectoris

Guy Leland Laraway, Jackson, Mich., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1885, aged 77, died, Oct. 20, 1937

Charles B. Long, Jonesville, Mich., Chicago Homeopathic Medical College, 1889, aged 75, died, Nov. 14, 1937, as the result of an automobile accident

George Freeborn Gavin, Boston, Bellevue Hospital Medical College, New York, 1885, aged 79, died, Nov. 6, 1937, of myocarditis and arteriosclerosis

Arthur Rose Guerard, Hollis, N. Y., Bellevue Hospital Medical College, New York, 1895, aged 86, died, Oct. 27, 1937, in Leesburg, Va., of thrombosis

Thomas Devan Bourdeaux ♂ Meridian, Miss., Medical College of Alabama, Mobile, 1902, aged 58, died, Nov. 24, 1937, of pneumonia and heart disease

Alfred H. Churchill, Oswego, Ill., Northwestern University Medical School, Chicago, 1899, aged 64, died, Nov. 27, 1937, of amyotrophic lateral sclerosis

Alice E. Twichell, Indianapolis, Physio-Medical College of Indiana, Indianapolis, 1896, aged 80, died, Nov. 16, 1937, of carcinoma of the uterus

Edmund Peter Larkin, Scranton, Pa., Jefferson Medical College of Philadelphia, 1912, aged 50, died, Oct. 25, 1937, of pulmonary tuberculosis

Everett T. Skeels, Toledo, Ohio, Eclectic Medical College, Cincinnati, 1912, served during the World War, aged 49, died, Oct. 11, 1937

John Emmett Hill, Monrovia, Calif., Jefferson Medical College of Philadelphia, 1897, aged 66, died, Nov. 19, 1937, in Rialto, of endocarditis

John W. Sublett, Jean, Texas, University of Louisville (Ky.) Medical Department, 1885, aged 76, died, Oct. 2, 1937, of pernicious anemia

Lille Forrest Chapman, Woodhull, Ill., Loyola University School of Medicine, Chicago, 1919, aged 45, died, Nov. 16, 1937, of heart disease

Clarence Merrill Clark ♂ St. George, Utah, Jefferson Medical College of Philadelphia, 1908, aged 62, died, Oct. 29, 1937, in Los Angeles

Karl Holden Chandler, Cleveland, Cleveland-Pulch Medical College, 1914, served during the World War, aged 46, died, Oct. 17, 1937

Benjamin D. Caldwell, Lambert, Miss., Vanderbilt University School of Medicine, Nashville, Tenn., 1880, aged 77, died, Oct. 13, 1937

Milton Arthur Barton, Plains, Pa., Louisville (Ky.) Medical College, 1905, aged 59, died, Nov. 4, 1937, of coronary artery thrombosis

John Edward Dance, Murfreesboro, Tenn., University of Nashville Medical Department, 1873, aged 89, died, Nov. 25, 1937, of senility

John Webster Crosswhite, Weston, Texas, Kansas City (Mo.) Medical College, 1892, aged 81, died, Nov. 3, 1937, of arteriosclerosis

John E. McFarland, Millgrove, Ind. (licensed in Indiana in 1897), aged 89, died, Oct. 13, 1937, of chronic myocarditis and nephritis

Oscar Sargent, Jacksonville, Ala., Vanderbilt University School of Medicine, Nashville, Tenn., 1880, aged 81, died, Oct. 24, 1937

George Williams Clark, Shippensburg, Pa., Eclectic Medical Institute, Cincinnati, 1904, aged 65, died, Nov. 13, 1937, of heart disease

Thomas E. Thompson, Mount Olivet, Ky., Cincinnati College of Medicine and Surgery, 1894, aged 71, died, Oct. 11, 1937

George Frank Allen, Aurora, Ill., Rush Medical College, Chicago, 1880, aged 82, died, Nov. 7, 1937, of aplastic anemia

Edwin Miles Wheeler, Baltimore, Baltimore Medical College, 1896, aged 67, died, Oct. 13, 1937, of angina pectoris

Romeyn B. Hart, Marietta, Ohio, Medical College of Ohio, Cincinnati, 1882, aged 79, died, Oct. 6, 1937

Correspondence

FEDERAL SUBSIDY TO SCHOOLS OF AGRICULTURE

To the Editor—My attention has been called to an editorial comment appearing on page 132 of the January 8 issue of *THE JOURNAL*. This item refers to and quotes from a statement of one of the Cornell trustees—Mr Babcock, representing the New York State Grange—with regard to federal pressure on the administration of the state colleges here at Cornell. This statement was an expression of Mr Babcock's own views. I enclose a letter written by Dean Ladd of the State College of Agriculture to Governor Lehman expressing contrary views, which are clearly, in my opinion, better informed and more fully in accord with the facts. I take it for granted that you will wish to give the same kind of publicity to the statement by Dean Ladd that you have given to that by Mr Babcock.

EDMUND E DAY, Ithaca, N Y

President, Cornell University

NOTE—The statement of Dean Ladd, in part, follows:

Honorable Herbert H Lehman,
Governor of the State of New York,
Albany, New York.

Dear Governor Lehman:

As the responsible head of the New York State College of Agriculture, I feel that I should inform you, the Chief Executive of the State, of recent statements widely reported in the press in regard to the relationships between the College and the Federal authorities which might lead to serious misunderstanding. I am sending this letter to you after conference with President Day and with his approval.

On December 15 or 16, several papers reported and badly garbled the speech made by Mr H E Babcock, Grange Trustee of Cornell University, before the Annual Meeting of the New York State Grange at Ogdensburg, New York. The statements as printed in the various papers are substantially identical but I quote from the *Ithaca Journal* of December 15:

H E Babcock of Ithaca told the New York State Grange today that the Federal Government was exerting constant pressure upon Cornell University in an effort to have more and more to say about the conduct of agricultural research and education.

He expressed the fear that unless the constant pressure (on Cornell) were checked it will lead us into complications and difficulties and I therefore have been very alert and shall continue to be alert to keep the management of the University within the State even if necessary at the cost of revenue if it comes from Federal sources.

I have immediately brought together the administrative heads of the various lines of work in the College of Agriculture and asked them to review this statement objectively with me in order to determine whether there are any factors in the field of State and Federal relationships that should give us concern.

Our administrative group feel, and I believe that we are unanimous, that the Federal Government has never within our experience attempted in any way to bring pressure to bear upon the research and teaching work of the State College of Agriculture.

Federal funds for aid in agricultural teaching are administered through the United States Department of the Interior and never in the slightest degree has that department attempted to influence the use of these funds except to check them carefully in order to make sure that they were used in compliance with the law.

Research funds provided by the Federal Government for use in the State are used for the support of very definite research projects. These projects are always initiated in the College of Agriculture. *The United States Department of Agriculture either approves or disapproves of the projects proposed by this institution. Since each basic law providing research funds has certain qualifications as to the fields of work that can be supported by that particular fund the Department of Agriculture is obliged to check carefully in order to see that the*

State College complies with the law in the expenditure of the funds. In this needless to say, the State College gives full cooperation and the only questions that arise are in regard to interpretation of the basic Acts. (Italics ours—EDIT)

The newspaper accounts also contain the following:

Babcock asserted his belief that Cornell research and teaching had waned.

I have read Mr Babcock's original manuscript and it contains no such statement. On the contrary, the original manuscript is highly complimentary to the work of the State College and to the members of the staff.

We believe that the research and teaching work has consistently improved in quality and effectiveness, but if any serious doubts should exist in regard to it, we should be happy to have this question studied by any qualified group of people.

I know of your keen interest and great confidence in the institution and the staff who are attempting to serve the State through this research, teaching, and extension teaching work. I am sure that it is unnecessary to defend the work before you. In view of the fact, however, that these newspaper reports have been widely printed, I feel that in all fairness you should have a statement from this institution giving the facts as we see them.

In order that the facts of the case may be brought as promptly as possible to the attention of those most directly concerned, I am taking the liberty of sending copies of this letter to members of the Cornell Board of Trustees, the Commissioner of Education, the Secretary of Agriculture, the Secretary of the Interior, and to selected members of our own staff.

Very truly yours,

CARL E LADD, Dean

THE FUTURE OF PATHOLOGY

To the Editor—Pathologists will doubtless agree in general with the Dorland dictionary definition of pathology as "that branch of medicine which treats of the essential nature of disease." Many, therefore, were doubtless disturbed, as I was, to read in the editorial comment in *THE JOURNAL*, January 1, page 50, under the heading given above, most of a column devoted to the activities of the hospital and private laboratory (i e, largely diagnostic procedures). Granting the correctness of the statements about pathology as applied to hospital and private laboratories, though much of this work may be technically biochemical, bacteriologic or serologic, should it not have indicated that only one phase of pathology was being considered? The future of pathology as a whole will be chiefly affected by its efficiency in maintaining and improving pathologic teaching and investigation and by the ability of all kinds of pathologists to adapt their specialty to the ever changing aspects of medical progress. Such factors as the pathologist's adequate control of hospital laboratory work, the part he takes in organized medicine and even his interest in clinical medicine, desirable and important though these features are, would seem to be of less importance to the future of the discipline.

When Dr Kracke made his presidential address to the American Society of Clinical Pathologists, it is obvious that his hearers correctly understood his use of the term "pathology" as referring to the type of work that his society was concerned with. As a topic in the editorial comment, however, the "future of pathology," interpreted in this way, presents Dr Kracke's special and narrower meaning to such a large number of the medical profession that serious misconception of the proper scope of pathology is unavoidable. I ask, then, that you publish this reminder that pathology is a basic branch of medical science which has been defined as dealing with "the causation, development, nature of and disturbances—structural and functional—produced by disease."

E B KRUMBHAR, M D, Philadelphia

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT HOWEVER REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

SULFUR METABOLISM AND ARTHRITIS

To the Editor—Please estimate the status of cystine determination of the nails and the colloidal sulfur treatment of arthritis. MD Cuba

ANSWER—Some observers long have held that sulfur and not the heat of sulfur baths benefits rheumatic patients. Hence the use of sulfur waters and sulfur tonics for rheumatism has attained favor on an empirical basis. In 1904 Goldthwaite noted a decrease in the content of sulfur in patients who had atrophic arthritis, also he observed a retention or positive sulfur balance in patients who had hypertrophic arthritis. In 1925 and thereafter Cavadias reported that patients who had arthritis deformans exhibited "a distinct disturbance of sulfur metabolism usually a deficient fixation of sulfur or deficient thiopexy." As a result, patients who had chronic rheumatism were in negative sulfur balance. The content of cystine in certain tissues, such as the fingernails, is regarded by some observers as a reliable indicator of the metabolism of sulfur in the body. The normal concentration of cystine in the nails has been reported as from 102 to 13 mg per hundred cubic centimeters, the average is 118 mg. Several investigators have reported that in patients with chronic arthritis the concentration of cystine in the nails was found to be low, from 65 to 98 mg, the average being 82 mg. Others have reported a range from 72 to 13 mg, with an average of 98 mg.

According to Sullivan and Hess, the body uses compounds of sulfur such as cystine, cysteine and glutathione in processes of detoxification. The nails of arthritic patients contain normal amounts of three basic amino acids, arginine, histidine and lysine, but the normal amount of cystine is reduced. This low concentration of cystine in nails therefore has been interpreted as an indication of the existence of an inadequate mechanism for detoxification in the presence of arthritis. After therapy with sulfur the cystine content of the nails rises in the presence of both atrophic and hypertrophic arthritis. Wheelodon therefore suggested that at least some, if not all, forms of arthritis are made possible by the presence of a deficiency of sulfur particularly in cartilage, which contains chondroitin sulfuric acid. He suggested also that if a patient is given a sufficient reserve of sulfur with which to combat the contributing etiologic factor, arthritis would not occur. He suggested that the presence of a sufficient reserve depends on the ability of the intestinal tract to absorb sulfur in a normal manner.

There has been a revival of sulfur therapy for arthritis since 1934. Various preparations of colloidal sulfur have been given intramuscularly or intravenously for different types of arthritis and rheumatism. Reactions due to the toxicity of sulfur have been rare. Fever, small cutaneous sloughs, fatigue, headache, drowsiness, anorexia, increasingly painful joints and less frequently urticaria, erythema, nausea, vomiting, cramps and diarrhea have occurred. Of patients who had atrophic or hypertrophic arthritis or fibrositis, the condition of from 50 to 85 per cent has been "improved." During the past year there has been a distinct recession of interest in such therapy. However, Forbes and others have recommended a diet high in sulfur and low in carbohydrate. They reported that, in general, patients who have chronic arthritis give evidence of indoluria, which suggested an impairment of the mechanism of detoxification in the liver resulting from a deficiency of sulfur in the body, sulfur being necessary for the detoxification of indole and for its conversion into indican. On such a diet "marked improvement" of a small number of patients who had atrophic or hypertrophic arthritis was noted, and evidence of indoluria disappeared.

Race in 1927 noted an increased excretion of neutral sulfur in the urine of twenty of forty-two patients who had atrophic arthritis and whose sulfur balance was positive. Senturia in 1935 also observed no evidence of abnormal partition of sulfur or abnormal elimination of sulfur in the urine of arthritic patients. According to Race in 1935 the lowered concentration of cystine of nails may be due not to a disturbance of general metabolism of sulfur but to the reduced albumin-globulin ratio in plasma. The concentration of cystine in globulin is lower than that in albumin and the amount of cystine

observed in nails may merely be a reflection of alterations in plasma proteins. Senturia in 1934 observed a normal glutathione content of the blood of patients who had atrophic arthritis, hypertrophic arthritis or peri-arthritis. Others, including Cecil, Kinsella and Dawson, have noted "disappointing results" from sulfur therapy in arthritis. A neutral observer would conclude that the rationale of such therapy is by no means established and that the results of therapy by the new colloidal preparations of sulfur are no better than those from a large number of other helpful but not curative procedures for arthritis. The Council on Pharmacy and Chemistry has repeatedly refused to accept "colloidal sulfur" preparations because of lack of sound evidence of their claimed usefulness.

The following articles describe recent work on the subject:

- Argy W P Arthritis Treatment with Sulfur by Intravenous and Intramuscular Injection *J Bone & Joint Surg* 16 909 (Oct) 1934
 1934 Arthritis Comparison of Cystine Content of Fingernails with Sedimentation Reaction of Blood *THE JOURNAL* Feb 23 1935 p 631
 Cecil R L Medical Treatment of Chronic Arthritis *ibid* Nov 24 1934 p 1583
 Dawson M H Chronic Arthritis in Nelson's Loose Leaf Medicine New York Thomas Nelson & Sons 5 605 1935
 Forbes J C Neale R C Hite O L Armistead D B and Rucker S L Studies on Effect of High Sulfur Low Carbohydrate Diet in Chronic Arthritis *J Lab & Clin Med* 21 1036 (July) 1936
 Kinsella R A Medical Aspects of Chronic Arthritis *Radiology* 24 413 (April) 1935
 Krestin David Treatment of Chronic Nonspecific Arthritis with Intramuscular Injections of Sulfur *Brit M J* 2 1144 (Dec 14) 1935
 Race Joseph Biochemical Investigations in Chronic Rheumatic Diseases in Reports on Chronic Rheumatic Diseases London H K Lewis & Co Ltd 1 55 1935
 Rawls W B Gruskin B J and Ressa A A The Value of Colloidal Sulfur in the Treatment of Chronic Arthritis *Am J M Sc* 190 400 (Sept) 1935
 Senturia B D Glutathione Content of Blood in Chronic Arthritis and Rheumatoid Conditions *J Lab & Clin Med* 19 1151 (Aug) 1934
 1934 Results of Treatment of Chronic Arthritis and Rheumatoid Conditions with Colloidal Sulfur *J Bone & Joint Surg* 16 119 (Jan) 1934
 Urinary Sulfur in Chronic Nonspecific Arthritis *J Lab & Clin Med* 20 855 (May) 1935
 Sashin David and Spanboch Joseph Intravenous Injection of Colloidal Sulfur in the Treatment of Rheumatoid and Osteoarthritis *M Rec* 142 332 (Oct 2) 1935
 Sullivan M A Sulfur and Cystine in Relation to Arthritis *M Ann District of Columbia* 3 233 (Sept) 1934
 Sullivan M A and Hess W C Cystine Content of Fingernails in Arthritis *J Bone & Joint Surg* 16 185 (Jan) 1934
 Wheelodon T Use of Colloidal Sulfur in Treatment of Arthritis *ibid* 17 693 (July) 1935
 Woldenberg S C Sulfur (Colloidal) Therapy in the Treatment of Arthritis with Report of 100 Cases *M Rec* 139 161 (Feb 21) 1934
 Sulfur (Colloidal) Therapy in Treatment of Arthritis *M Bull Vet Admin* 12 10 (July) 1935
 Treatment of Arthritis with Colloidal Sulfur Report of 250 Cases *South M J* 28 875 (Oct) 1935

PILOCARPINE IN ALOPECIA

To the Editor—Is pilocarpine nitrate as recommended for alopecia given by mouth? Which is more effective pilocarpine nitrate or pilocarpine hydrochloride? Over how long a period should these drugs be administered before a result may be expected? What is the danger of toxicity and undesirable side actions? MD New York

ANSWER—Pilocarpine in the treatment of alopecia is applied in a lotion. Either the nitrate or the hydrochloride is effective, the only difference between them being the solubility. This would make no difference in the usual lotion, which contains only 0.5 per cent of the drug. No prognosis can be given without a statement of the kind of alopecia to be treated. Toxic alopecia, the partial baldness that follows fevers, pregnancy or other toxic conditions, responds in most cases promptly, in a few months. Alopecia areata is difficult to prognosticate, one case clearing up in a few months, another apparently similar case refusing to improve even after years of energetic treatment. Seborrhoeic alopecia can usually be brought to a cessation of hair loss in a few months. Congenital alopecia and senile baldness are usually resistant to treatment.

Pilocarpine stimulates the parasympathetic nervous mechanism. In toxic doses it causes miosis and spasm of accommodation, disturbing vision, causes intense sweating, vomiting, diarrhea, cardiac weakness, dyspnea, great increase of bronchial secretion, leading to edema of the lungs, uterine tetanus, abortion and sometimes sudden collapse. It is contraindicated in pregnancy and asthma and in patients who tend to edema of the lungs. The drug is difficult to use because its action varies in different patients because of the fact that their parasympathetic sympathetic balance is disturbed at different points. One patient sweats promptly and severely, the next one refuses to sweat at all but may react in some other way. On the skin its toxic action has been recorded as resulting in an itching eruption which may be macular, papular or wheal like. This occurs rarely.

Among its other effects it stimulates the sweat and sebaceous glands and has a reputation among dermatologists as a stimu-

lant of hair growth Jackson and McMurtry (Treatise on Diseases of the Hair, Philadelphia and New York, Lea & Febiger, 1912, p 94) state that "a host of medicinal agents have been recommended for stimulation of the hair. The only one that seems to exert a specific action is pilocarpine." Not only does it stimulate, in rare instances it causes the hair to become dark. This has been noted both from internal use of the drug and following its use in a lotion. The latter acts in all probability by allowing absorption of the drug through the skin. This view is supported by the case cited by Milko (Ein Fall chronischer Pilocarpinvergiftung, *Klin Wchschr* 9 170 [Jan 25] 1930). A man, aged 43, complained of attacks of a feeling of oppression in the chest succeeded by momentary loss of consciousness. These attacks came on when he exerted himself, as by walking up stairs or lifting heavy objects. At other times he had unpleasant sensations in the cardiac region and became easily tired, very nervous and mentally depressed. He at one time had diarrhea for two weeks, not controlled by diet or home remedies and in three months he had lost 17½ pounds (8 Kg). On examination nothing abnormal was found except lassitude, a slow pulse, and the action of the pupils, which although reacting promptly to light and in accommodation did not dilate fully. The patient stated that he did not use sedatives but finally mentioned a scalp lotion containing 0.5 per cent pilocarpine, which he had used daily for several months, about a month longer than the illness. When this was discontinued he promptly recovered and in three weeks gained 13 pounds (6 Kg). This seems to be the only case of pilocarpine poisoning from the use of a lotion, although it has been used in this way by thousands. Milko recommends that its use for the treatment of alopecia be discontinued, but whether this is necessary or not, the case is a warning that one should always forbid refilling prescriptions for such lotions and insist that the patient see the doctor frequently during their use.

CAROTID SINUS SYNDROME

To the Editor—A man aged 56 is suffering from a carotid sinus syndrome. The blood pressure varies between 145/90 and 170/110. Digital pressure causes unconsciousness. One of the consultants suggested denervation of the sinus. Kindly give the indications for and prognosis of operations in such cases. The patient is highly neurotic but excepting for the spells of dizziness his condition does not interfere with a normal conduct of life. What is the mortality in case of surgical intervention? Please refer me to literature. M D New York.

ANSWER—In order to use rational therapy, it is first necessary to determine the type of carotid sinus reflex which is hypersensitive. Attacks of syncope may be due to one or a combination of three separate mechanisms: (1) a vagal reflex resulting in slowing of the heart, (2) a vasomotor reflex resulting in a fall in blood pressure independent of the heart, and (3) a cerebral reflex which may cause syncope and convulsions without significant alterations in blood pressure or pulse rate. The first and the last are the most common. Differentiation is readily accomplished by giving the patient 0.001 Gm (one-sixtieth grain) of atropine sulfate intramuscularly and when the atropinization is maximal, usually in from forty-five to sixty minutes, the carotid sinus is stimulated by pressure and the effect observed. If syncope is abolished, the symptoms are due to the vagal reflex. If syncope occurs as before, in spite of the absence of significant cardiac slowing or drop in blood pressure (type 2) the cerebral reflex is hypersensitive.

Therapy of the irritable vagal reflex is easily accomplished by daily doses of belladonna. If enough is given to dry the mouth slightly but not uncomfortably, the attacks are usually relieved. Operation is not indicated in this group. In the cerebral type of sensitivity no specific therapy is available. Operation is not to be advised unless all other forms of treatment fail and the patient is incapacitated. General measures to reduce nervousness, fatigue and worry sometimes are useful. Tobacco, alcohol and coffee should be prohibited to determine whether they are responsible. Vitamin B concentrates should be given. Surgical denervation has been performed in a number of cases without any deaths. In properly selected cases it is usually successful, but especially in older persons it carries definite dangers, owing to the temporary hypertension and tachycardia that result.

Finally, it should be pointed out that the presence of a hypersensitive carotid sinus in a patient with dizzy spells does not necessarily prove that the former is the cause. The induced attacks must be identical with the spontaneous ones.

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VITAMIN D MILK

To the Editor—1 How much irradiated milk is equivalent in vitamin D content to a teaspoonful of cod liver oil? 2 In the vitamin D milk Vitex how much vitamin D is added and what is its content compared with irradiated milk? M D Connecticut

ANSWER—1 Most of the irradiated milks that have been accepted by the Council on Foods contain 135 U S P units of vitamin D per quart. There are some dairies, however, which market irradiated milk containing 200 U S P units of vitamin D per quart. Cod liver oil, U S P, contains a minimum of 315 U S P units of vitamin D per teaspoonful. 2 "Vitex" concentrate is added directly to the milk prior to the pasteurization. The fluid milks fortified by this concentrate which have been accepted by the American Medical Association Council on Foods contain 400 U S P units of vitamin D per quart. The Council on Foods published a report on the present status of vitamin D milk in THE JOURNAL, Jan 16, 1937, page 206, which should be consulted. Since publication of this decision the Council has accepted vitamin D milk produced by feeding irradiated yeast to cows and containing a minimum of 400 U S P units of vitamin D per quart sold under the name of Metabolized Milk, and milk fortified by the addition of irradiated ergosterol and containing 400 U S P units of vitamin D per quart.

TREATMENT OF ACNE ROSACEA

To the Editor—1 What is the best treatment for acne rosacea? The patient is in her late thirties. 2 Is an autogenous vaccine of value? M D, North Carolina

ANSWER—Three objectives in the treatment of acne rosacea are: (1) abolition of the reflex which dilates and finally paralyzes the blood vessels of the flush areas of the face, (2) removal of local irritation and (3) removal of the results of chronic disease.

1 Too rapid eating or overeating should be forbidden and many articles of diet must be eliminated. Hot foods and hot drinks, coffee, tea, alcohol, condiments, rich gravies and heavy desserts, are not allowed. Tobacco is also forbidden. Anything that may arouse a reflex from the stomach is to be avoided. Plenty of water must be taken. If a gastric analysis reveals a deficiency of hydrochloric acid in the stomach the dilute acid should be given, about 13 cc (20 drops) with or after each meal, sipped through a glass tube. If acid is hyperabundant in the stomach, alkalis may be given and the meals made small and frequent. Focal infection, particularly in the nose or mouth, must be found and eliminated. After removal, autogenous vaccine may be of benefit. Pelvic disease, if present, should be treated. If there are indications of an early menopause, appropriate treatment should be given, bromides being avoided for fear of increasing gastric irritation and encouraging pus formation, which bromides frequently do. Symptoms indicative of hyperthyroidism or other endocrine disturbance should not be overlooked. Nervousness from other causes, often emotional, should be treated by calm discussion and advice. Hachenburg found high blood pressure in more than half the cases that he investigated (Hachenburg, D. Research on the Basic Factor of Acne Rosacea, *Dermat Wchschr* 92 165 [Jan 31], 197 [Feb 7] 1931).

2 Amelioration of the flushing and eruption can be obtained by the local application each night, after washing the face with soap and tepid or cold water, of a sulfur preparation, lotio alba. The most useful one is made of sulfated potash and zinc sulfate, 1 Gm (15 grains) of each, in 30 cc (1 fluidounce) of rose water. If this causes too much drying and scaling, 3 cc (45 drops) of glycerin may be added, but the best results are obtained when the skin is kept quite dry. Cold cream, hot water and massage by the beauty specialist should be avoided. The lotion should be prescribed in small amounts and frequently renewed, for it soon loses its strength. Some patients with rosacea have an irritable skin and it may be necessary to begin with half strength lotion.

Ultraviolet radiation in doses capable of causing a mild erythema is beneficial, even more so, in the pustular cases, than x-rays, according to Andrews (Andrews, G C. Diseases of the Skin Philadelphia, W B Saunders Company, 1930, p 511). The patient should be treated twice a week.

Treatment with roentgen rays in divided doses, one-eighth unit (37 roentgens) or one-fourth skin unit (75 roentgens) once a week until the skin clears, is valuable. It should be discontinued if a dose of three full units has been given without success. There is some danger of damaging the skin.

If a scaly blepharitis is present the aid of an ophthalmologist should be enlisted.

The contents of the pustules should be examined for Demodex folliculorum, and if this is found abundantly present, the strong

sulfur treatment as advocated by Samuel Ayres Jr and N P Anderson may be tried (*THE JOURNAL*, March 4 1933, p 645) They advise the application, after washing the face with soap and water, of the Danish ointment for scabies This is allowed to remain on the face all night and is removed in the morning with cold cream This procedure is repeated on the following two nights If the course of three applications does not suffice to clear the eruption, the ointment may be applied once or twice a week thereafter Of forty-seven cases treated in this way, they report that forty-five showed good results

The removal of the after-effects of rosacea is attained by the destruction of the telangiectatic vessels This is done by electrolysis, the needle attached to the negative pole being inserted into the vessel and a current of from 1 to 15 milliamperes being allowed to flow for a few minutes until the vessel turns white The needle is then removed while the current is still flowing, to prevent bleeding If the first application is not sufficient, the treatment may be repeated after the small punctures heal The other lasting bluish resulting from rosacea, rhinophyma, enlargement of the end of the nose, seldom occurs in women

HELIUM OXYGEN MIXTURES

To the Editor—I have read in newspapers of the use of helium gas as mixed with air in treatment of diseases of the lungs but am unable to locate scientific articles on this subject Has it been studied in anaerobic and aerobic states of bacterial cultures and if so are reports in print? Are there articles describing reactions when it may be injected into the tissues?

S F HOGE MD Little Rock Ark.

ANSWER—The therapeutic use of helium in asthma and obstructive lesions of the trachea and larynx depends wholly on its decreased specific gravity in relation to nitrogen Since the weight of a comparable volume of nitrogen is seven times greater than that of helium, a mixture of 21 per cent oxygen and 79 per cent helium may be substituted for 21 per cent oxygen and 79 per cent nitrogen (air) thus providing a respirable gas mixture which has one third the density of air The velocity of movement of a gas through small orifices is proportional to the square root of the density of the gas, the helium-oxygen mixture would require therefore, almost half the pressure required for air for its passage through constricted orifices (Barach A L The Therapeutic Use of Helium, *THE JOURNAL*, Oct 17, 1936, p 1273, other references are given in this article) Sayers and Yant showed that animals could be decompressed from ten atmospheres of helium-oxygen mixture in one third the time necessary for a nitrogen-oxygen mixture (Sayers, R R, and Yant W P Value of Helium-Oxygen Atmosphere in Diving and Caisson Operations *Anesth & Analg* 5 127 [June] 1926) Rabbits have lived in mixtures of 79 per cent helium and 21 per cent oxygen for two months without harmful effect and it has also been shown that helium, as well as the other rare gases may be removed from the atmosphere without evident changes in animal life (Barach A L Rare Gases Not Essential to Life, *Science* 80 593 [Dec] 1934) The root growth of the sweet pea takes place in atmospheres as low as 15 per cent of oxygen when the diluent is nitrogen, but if the diluent is helium, growth will proceed in a concentration as low as 0.5 per cent of oxygen owing to oxygen diffusing more quickly through helium than through nitrogen (Cannon and Free *Carnegie Inst Washington Year Book* 19 59 1920) No articles have been published concerning the effect of the subcutaneous injection of helium

ACETYSALICYLIC ACID ACETOPHENETIDIN AND SODIUM SALICYLATE

To the Editor—What is the relative rate of absorption excretion and toxicity of acetylsalicylic acid (aspirin) acetophenetidin (phenacetin) and sodium salicylate? Is there any way of avoiding a yellow coloration of the urine when these substances are excreted? What may be considered safe doses of these substances when administered for a long time in cases such as irritable spine due to strain caused by an automobile accident? Is there any other safe drug more efficacious than those just mentioned which can be given instead?

E W HOUGHTON MD Detroit

ANSWER—Sodium salicylate administered by mouth appears in the urine in from fifteen to eighteen minutes With doses of from 1 to 2 Gm the excretion is completed in twenty-four hours, with doses of from 4 to 5 Gm, in forty-four hours Acetylsalicylic acid is more slowly absorbed because it must pass through the stomach before it can undergo absorption in the intestine It is also more slowly eliminated, requiring an average of five days for elimination after full therapeutic dosage Acetophenetidin is rather rapidly absorbed The full therapeutic action is obtained within two hours and usually does not last longer than eight hours The average U S P dose of acetophenetidin is given at 0.3 Gm and twice that quantity may

generally be considered safe The average dose of acetylsalicylic acid is stated at 0.3 Gm but three times that dose may safely be given to any excepting an allergic adult The average U S P dose of 1 Gm for sodium salicylate had better not be exceeded for more given at one time is not likely to be retained by the stomach Of all the analgesics, acetylsalicylic acid is probably the safest and most efficient, provided there is no idiosyncrasy Its analgesic action may be increased by adding a barbiturate, such as phenobarbital (e g, in one tenth the dose of the acetylsalicylic acid) to each dose

AUTOINTOXICATION

To the Editor—Please give me the present status of opinion on auto-intoxication What chemical compounds if any are believed to cause the symptoms?

W A FOWLER, MD Norman Okla

ANSWER—This subject was reviewed extensively by W C Alvarez (*Intestinal Auto-intoxication, Physiol Rev* 4 352 [July] 1924), who pointed out that what was commonly assumed to be a chemical intoxication could not usually be such, since relief of the alleged toxic symptoms occurred immediately after emptying of the bowel It was considered therefore that the source of irritation must be mechanical rather than toxic Up until that time also no chemical had been implicated as the cause of auto-intoxication, since it was not possible to show that the substance in question could get through the intestinal mucosa and pass the capillaries of the liver and lung unchanged Definitely less interest in the subject has existed in recent years but observations have been reported by Hines, Lueth and Ivy (*Arch Int Med* 44 147 [July] 1929), Percy and Van Lier (*Tr Am Gastro A* 1925, p 135) and Percy and Allen (*Am J Physiol* 82 56 [Sept] 1927)

Histamine has been thought to be one of the substances possibly causing auto-intoxication but Weiss, Ellis and Robb (*Am J Physiol* 90 551 [Oct] 1929) injected histamine steadily into the blood stream and found that it was destroyed almost as rapidly as it entered Wangenstein and Loucks (*Arch Surg* 16 1089 [May] 1928, abstr *THE JOURNAL* June 30 1928 p 2138), also concluded that the amount of histamine absorbed even from the strangulated loops of the intestine was small Further studies on this subject have been reported by Koessler and Hanke (*J Biol Chem* 59 803 [April] 1924) Swingle and Nicholas (*Am J Physiol* 69 464 [Aug] 1924) Biehl (*Deutsche Ztschr f Chir* 218 135, 1929) and Power and Sherwin (*Arch Int Med* 39 60 [Jan] 1927)

It has been demonstrated that cathartics increase the permeability of the intestine for toxic substances Schwartz (*Arch Dermat & Syph* 13 672 [May] 1926) concluded that internal toxemia is an important factor in many dermatoses The demonstration of the effects of such toxins in the blood stream however, is not evidence of their passage from the intestine into the blood stream since many protective factors exist A good review of the possibilities of bacterial toxins passing into the blood has been published by Zinsser (*J Immunol* 5 265 [May] 1920)

CARCINOGENIC PROPERTIES OF VARIOUS OILS

To the Editor—Are the commercial mineral oils carcinogenic? I ask because of the occurrence of a shale oil cancer in the skin of the forearm of a patient of mine who uses shale oil to refine (or grind) lenses in a local optical factory If mineral oil can be carcinogenic to the skin is it also carcinogenic to the gastro-intestinal tract when taken by mouth?

RICHARD A LEO ARDO MD Rochester N Y

ANSWER—The refined mineral oils used for their laxative effect are not carcinogenic either to the skin or to the intestinal tract Extensive tests have been made on animals with these refined oils and no evidence of carcinogenic action has ever been obtained On the other hand some of the crude lubricating oils are carcinogenic, but not invariably so The carcinogenic properties vary in the oils from different wells and from different parts of the United States Shale oil has usually considerable carcinogenic qualities, but here again each sample of oil would have to be tested to prove its carcinogenicity Tests have been made on the English shale oil No reports published in this country have been found

Few cases of carcinoma due to lubricating oils have been seen in the United States In fact it has been denied that there are any examples in this country Almost all of the reported instances of lubricating oil cancer were found in England because some 530 examples occurred in a group of workers known as mule spinners the machinery they were working spraying oil on their clothing Their trousers became saturated with oil and most of the cancers appeared on the scrotum It would be of interest to have a sample of the

shale oil in question tested by painting the skin of white mice, for it is possible that the cancer present is not due to the oil, because such cancers do not appear even in those working with carcinogenic oils if reasonable care is taken to wash the oil off after the day's work.

HIGH FEVER WITH SURVIVAL

To the Editor—What is the highest temperature to which the human body has been known to reach and still survive? M D Illinois

ANSWER—It is difficult to answer this question accurately in view of the large number of case reports of high fever, most of which have not been adequately supported from a scientific point of view. Fever of 106 and 107 F occurs with sufficient frequency in case reports to lend credence to the reliability of such figures. High terminal temperatures have been reported in the literature sufficiently often to indicate that these may actually go to 110 or 111 F. Such temperatures have been reported in terminal chronic nephritis, in a large number of cases of necrosis of the liver and liver deaths the temperatures have been recorded at 105 to 109. It is difficult to accept the case reports of exceptionally high temperatures (114 F) such as that reported in 1902 by Holt and those reported in *Time*, July 16 and Aug. 30, 1937, since most of the similar reports actually investigated by competent authorities have demonstrated some fictitious element. It would probably be safe to say that temperatures of between 107 and 108 F have been recorded for short periods with subsequent recovery and that temperatures of 109 to 110 have been recorded before death. There may be higher temperatures in both groups, but when such occur they should require thorough investigative corroboration before acceptance.

'SULFOMID

To the Editor—Is Sulfomid of William P. Poythress & Company Inc., accepted by the Council on Pharmacy and Chemistry? It is noted in a circular for the product that claims are made that Drs. Dees and Colston of Johns Hopkins Hospital demonstrated that gonorrhea can be rapidly cured by the use of Sulfomid. As I recall the article in *THE JOURNAL*, Drs. Dees and Colston never mentioned Sulfomid.

L N P Columbus Ohio

ANSWER—Neither Sulfomid nor any other product of William P. Poythress & Company stands accepted by the Council on Pharmacy and Chemistry of the American Medical Association. As it is properly pointed out, Drs. Dees and Colston did not mention Sulfomid in the article in *THE JOURNAL*. A communication from Dr. Colston informed the editor that the series of cases were treated entirely by sulfanilamide manufactured by the Winthrop Chemical Company, Inc., E. R. Squibb & Sons, and Merck & Co.

This is another example of a drug concern apparently endeavoring to "cash in" on the possibilities of a new drug, endowing it with a fanciful proprietary name. The Council on Pharmacy and Chemistry has already accepted nine brands of sulfanilamide, all of which conform with rigid standards for New and Nonofficial Remedies. There is little excuse, therefore for using a product marketed under a proprietary name, or for using brands put out by houses that do not cooperate with the Council on Pharmacy and Chemistry.

DIPHTHERIA CARRIERS

To the Editor—What local treatment is considered effective for diphtheria carriers? What type of isolation is necessary?

WILLARD F. GOFF M.D. Seattle

ANSWER—There is no thoroughly reliable medical procedure for the treatment of diphtheria carriers. Sometimes a spray consisting of 2 per cent aqueous solution of gentian violet seems to be effective. This spray is rather irritating and is objected to by some patients. However, its reactions are not as severe as those produced by the quartz light, for which great efficiency was once claimed.

The most dependable means for freeing the noses and throats of diphtheria carriers from the offending organisms is complete removal of tonsils and adenoids. This surgical measure seldom fails.

If the diphtheria carrier harbors a virulent organism complete isolation is required for the protection of others. This is especially necessary if the known carriers are employed in institutional work where large numbers of children may be exposed. It is advisable in the case of chronic diphtheria carriers to have a laboratory conduct tests to determine whether or not the organism is virulent. Carriers with nonvirulent organisms are usually not restricted with regard to their freedom of action.

PLASTIC REPAIR OF EYELID

To the Editor—A man aged 55 sustained an automobile accident in which the lids of the right eye were injured. The lower lid was only superficially injured. The right upper lid was cut to the tarsus almost the entire length. At about the middle of the upper lid there is a punched out wound through the entire lid a centimeter in diameter. The intense edema is subsiding and the wound is healing but the circular wound will not close in sufficiently to cover the eyeball. The cornea lens and iris are getting back to normal. Would the best procedure be to denude the wound of scar tissue or graft new tissue in the lid? The patient's eyes are of medium size and fairly prominent and there is not much redundant skin over the lids. Your minute suggestions will be greatly appreciated.

M D Nebraska

ANSWER—It will probably be best to wait for complete healing, even if a fistula through the lid develops, and make any repair later that is necessary for the permanent protection of the globe. Operation in the presence of edema and contamination might cause active infection to develop, and the fact that the cornea and globe are improving is further reason for not risking a spread of infection at present. If it becomes apparent that repair of the opening is necessary, there should be careful separation of mucosa from the skin at the opening, and it should then be turned in and the outside defect covered with a small flap from above the eyebrow. It is not a satisfactory place for a free graft to grow.

If healing can be awaited, there will almost assuredly be an elevation of the tarsal border along the cut, and this defect could probably be repaired with a free skin graft after carefully dissecting the tarsal border down into place without going entirely through the lid.

HETEROPHILE ANTIBODIES IN INFECTIOUS MONONUCLEOSIS

To the Editor—Of how much value do you consider the test for heterophile antibodies (Davidsohn Israel *J Infect Dis* 53:219 [Sept Oct 1] 1933) in the diagnosis of infectious mononucleosis? Would a negative test prove the absence of infectious mononucleosis?

ARTHUR R. ABEL M.D. Orange N.J.

ANSWER—The test for heterophile antibodies is specific for infectious mononucleosis, with the one exception of serum sickness. The latter diagnosis can usually be ruled out by the history, clinical picture and blood smear.

The test is nearly always positive for a period varying from one to four weeks during the acute stages of the illness. In the late stages it may be negative in spite of residual fever and a positive blood examination. The test usually becomes positive on about the fifth day of the disease. A negative test during the acute stage of the disease is strong evidence against the diagnosis of infectious mononucleosis.

CHLORINE INHALATIONS IN COLDS

To the Editor—Kindly give me the scientific status the practical application and the methods of procedure in vogue for the use of chlorine inhalations in colds.

M D Florida

ANSWER—The inhalation of chlorine in the treatment of colds has been largely abandoned. Many reasons contributed to its abandonment. Among them was the difficulty in maintaining a concentration of chlorine within the narrow effective limit. The original article dealing with this subject was published by Vedder and Sawyer in *THE JOURNAL*, March 8, 1924, page 764. A further article by the same authors appeared in *THE JOURNAL*, Jan. 31, 1925, page 361. This article describes an apparatus devised by the authors for the administration of the treatment.

No publication in the English literature dealing with this subject has been listed in the *Quarterly Cumulative Index-Medicus* since 1926 and none of the contemporary publications add materially to information given in the references cited.

WHEAT GERM AND CANCER

To the Editor—An article in the *Los Angeles Times* attributed the growth of cancer to the ingestion of wheat germ. The last part of this article states that the danger to human beings appear to be ruled out because if the rats were fed wheat germ oil that had been extracted under pressure they did not develop cancer. In this city there is a large amount of wheat germ sold in bulk and used as a cereal for vitamin purposes. It is being used in this way by one of my patients and with apparent benefit for median nerve neuritis. Please send me any further information as to the dangers of the habitual use of the wheat germ as a breakfast cereal.

M D California

ANSWER—The original article of Dr. Rowntree regarding the effect of a crude wheat germ oil appeared in November 1937 issue of the *American Journal of Cancer*. It is to be noted that only this special crude type of preparation produces tumors. There is no danger as far as is known at present of producing tumors in persons using the common wheat germ preparations on the market.

* Verification of graduation in process

Book Notices

The Scientific Basis of Physical Education By F W W Griffin M A M D B Ch Medical Adviser to the Incorporated Lucas Tooth Boys Training Fund (Lucas Tooth Gymnasium London) With a foreword by Sir E Kaye Le Fleming M A M D B Ch Chairman of Council British Medical Association Cloth Price \$2.75 Pp 203 with 7 illustrations New York & London Oxford University Press 1937

This volume approaches the subject of physical education from a new angle, that of the physician who supervises or advises with regard to the program of activities. It reflects very wide reading, as evidenced by the more than 200 references in the bibliography, and includes the most recent work. The material is presented in good form and style and most of it is convincing, the least so being the portion in which the author tries to justify breathing exercises taken as such and without regard to the physiologic needs of the body at the time. Most United States physiologists during recent years have felt that deep breathing should be practiced only in response to the requirements of the body for more oxygen. The physiology and mechanics of exercise are reviewed and the recent investigations from many sources are brought together in small compass. Unusual and significant material includes a discussion of the psychologic aspects of physical achievement, an important phase usually overlooked altogether, and a section presenting some work on optimal rates of exercise, such as walking, in terms of oxygen needs and caloric expenditures, and formulas for calculating the work done in an exercise such as climbing stairs. If some one could only determine the optimal amount of exercise for any individual! Here the busy person interested in really intelligent work in physical education will find material for which he would have to search many long hours if he went to original sources. It is a valuable contribution.

The Thinking Body: A Study of the Balancing Forces of Dynamic Man By Mabel Elsworth Todd Foreword by E G Brackett M D Cloth Price \$4 Pp 314 with 91 illustrations New York & London Paul B Hoeber Inc 1937

This is an unusual book in content and in style. It approaches health and posture from the engineering point of view but evidences an exact knowledge of mechanics, anatomy, physiology and posture, as well as considerable psychology and philosophy. The style is terse, forceful, sometimes picturesque, often reminiscent of Victor Hugo. That such a style may sacrifice accuracy at times is shown by this statement at the beginning of chapter VIII: "To breathe is life, without breath we die, to breathe rhythmically is health." This scans well and sounds well but, when one analyzes the thought, one is compelled to doubt whether breathing rhythmically is health always and without the fulfilment of other conditions.

The technical material is presented excellently and thoroughly. It should be helpful to physicians, orthopedists, physical therapists, physical educators—to all who are attempting to aid people in conserving muscular and nervous energy in their daily tasks. However, it is not easy reading for one without technical knowledge and probably is not intended for him. The illustrations are clear and helpful.

A novel and useful emphasis in the work is placed on mental and physical preparation for effort, an emphasis which is given practically by athletic coaches and trainers but hasn't so often been put into words to indicate a prerequisite for the most effective and economical performance. The importance of balance and proper relation of different parts of the body is discussed properly and in detail.

If unfavorable criticisms were to be joined to the vastly more numerous favorable ones deserved there might be two: first, that the title is misleading although catchy, in that the text seems to discuss a body thought about rather than thinking, second and much more important, that when the author comes to practical applications of her excellent theories she speaks more like a dancer and less like a scientist, more artistically and mystically than clearly. For example: "To balance bodily forces think down the back and up the front. Let the spine drag but keep the front of the body up. Thinking up the front of the body without lifting any of its bony parts will maintain proper traction." To the neophyte this thinking of

a part of the body up without moving it appears difficult and perhaps not quite cricket. But this may be petty caviling and the more expert for whom the book is intended may have no difficulty with it in any part. To them it should be a valuable contribution, and to the reader of average intelligence who is interested in posture a stimulating and thought-provoking work.

Vāgbhata's Aṣṭāṅgahṛdayasamhitā Ein altindisches Lehrbuch der Heilkunde Aus dem Sanskrit ins Deutsche übertragen mit Einleitung Anmerkungen und Indices Von Luise Hilgenberg Dr med Dr phil und Willibald Kirfel ord Prof für indische Philologie an der Universität Bonn Erste Lieferung Paper Price 3.50 guilders Pp 64 Leiden E J Brill 1937

Of all the great textbooks of Indian medicine the one written by Vāgbhata before the eighth century A D was least known in the Western world as it had never been translated into any European language. Complete English translations of the works of Sushruta and Charaka have been available for some time, and yet the textbook of Vāgbhata enjoyed just as much popularity in India if not even more. More manuscripts have been preserved and more commentaries were written on this than on any other Indian medical book. It was translated into Tibetan and became part of the Buddhist canon of the Lamaic church. The book was written in verse like other similar textbooks of medicine and was memorized by generations of Indian physicians. The present translation is extremely welcome. It fills an important gap in the historical literature of medicine and is an admirable piece of work—the result of the cooperation of Professor Kirfel, who is not only an Indologist but also well versed in the scientific literature of India, and of Dr Hilgenberg, who besides being a philologist is a physician as well. There is no doubt that the best way to approach such difficult ancient texts is through the close cooperation of philologists and physicians. The Sanskrit text was printed in Bombay in 1891, and the translators have not attempted to render it in verse form. Their prose translation reads smoothly. Drug names and technical terms have been translated, but in each case the Sanskrit term is given in brackets. Difficulties are explained in extensive footnotes. Vāgbhata's book is divided into six sections and 120 chapters dealing with theoretical foundations of medicine, anatomy and physiology, etiology, cures and the preparation of drugs, and ending with chapters on the nursing of children and their diseases, mental diseases, diseases of the eyes and ears, and venereal diseases. The two parts published so far contain the first twenty-five chapters of the book, beginning with interesting definitions. For instance: "Physician, remedy, nurse, and patient are the four factors and in therapy four qualities are attributed to each of them. The physician must be skilful, must have received his science from a most worthy teacher, must have had practical experience and be honest and the patient must be wealthy, devoted to the physician, communicative, and of good character." These first twenty-five chapters discuss hygienic rules, diets and other general treatments, and they are all full of material of greatest interest not only to the history of medicine but to the history of civilization as well.

Textbook of Materia Medica Pharmacology and Therapeutics By A S Blumgarten M D FACP Associate Attending Physician to the Lenox Hill Hospital New York Seventh edition Cloth Price \$3 Pp 845 with illustrations New York Macmillan Company 1937

The fact that this is the seventh revised and reset edition of this standard book on materia medica, pharmacology and therapeutics for nurses is in itself proof of its established value. It aims to teach nurses "to observe the effects of drugs on patients to recognize the earliest toxic symptoms, to understand the objectives of the physician in prescribing a remedy, and to administer a remedy in such a manner that the maximum desired effect is obtained." Each chapter is followed by questions of three types: the research type, the unfinished type, and those which emphasize the practical aspects of the subject. There is a rather extensive introduction on the administration of medicines including methods of dose calculation. The book concludes with chapters on medicinal foods and physical therapy. When one contemplates the 778 closely printed pages, the contents of which the pupil of nursing is supposed to assimilate in the relatively few hours she can devote to such study, one wishes that this book were considered merely as a reference handbook.

Medical Leaves 1937 Editor in Chief Joseph C. Beck, M.D. Editors Hershel Meyer, M.D., Irwin Rubell, M.D., and Louis Parmacek, M.D. Published under the auspices of the Hlstaadruth Paper. Price \$2. Pp. 198. Chicago: Medical Leaves Inc., New York: Jewish Frontier, 1937.

This volume is distributed with the purpose of raising money to aid the Jewish Frontier and League for Labor Palestine. It contains an assemblage of individual contributions on a variety of subjects, ranging from an essay on the pituitary gland and its hormones by J. B. Collip and on backache by Julius Friedenwald to an essay on "The Atmosphere of Books" by Dr. William Mayo. Much of the material is reprint and reiteration. It is to be hoped that any future publications of similar character may be planned according to some definite scheme. Unfortunately, far too many volumes of this type serve merely as repositories for essays which could not find publication elsewhere. No doubt it requires extraordinary courage on the part of an editor of such a publication to reject material not equal to the highest standards of medical literary competence.

Allgemeine und spezielle chirurgische Diagnostik. Ein Lehrbuch für Studierende und Ärzte. Von Professor Dr. Max Kappis, Direktor der Chirurgischen Universitätsklinik Würzburg. Second edition. Paper. Price 23 marks. Pp. 736 with 550 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1937.

Although extensively rewritten, this edition resembles the first, especially as far as the distribution of the material is concerned. The first part discusses the general principles of surgical diagnosis and the general and local symptomatology. The second part describes the general surgical diagnosis and is subdivided into chapters dealing with various types of injuries, the healing process, different kinds of surgical infections and, finally, surgical diseases arranged according to the tissues involved. The third part is devoted to special, i. e., regional surgical diagnosis. The wisdom of such arrangement of the material is doubtful, as overlapping and repetitions are unavoidable. As the differential diagnosis did not receive due consideration and the subject is chiefly of a character found in textbooks on general surgery, the title of the work is somewhat of a misnomer. A few omissions are noteworthy: parathyroid tumors, terminal ileitis and granuloma inguinale. Illustrations are plentiful and deserve commendation. Altogether the book must be considered useful not only for a surgeon but for a general practitioner, because of the wealth of important material presented in a simple, adequate manner.

Personality and Other Things (a Saml. Autobiography) By Harold Hays, M.D., F.A.C.S. (Introduction by Dr. Henry C. Link.) Cloth. Price \$2. Pp. 163 with one illustration. New York: American Physicians Inc., 1937.

In this book the author has combined a number of miscellaneous writings, leading with a statement as to why he became interested in writing and explaining the value of personality in a successful career. The book contains many references to leaders in medical and other affairs with whom the author has been associated from time to time. The volume concludes with a short story and poem. While the book contains much that is useful and suggestive, it is sad to observe the selection of books which Dr. Hays would recommend as part of every physician's library. The last two books are those of Dale Carnegie and Adolph Lorenz. Dr. Hays ought to know better.

The Abdominal Surgery of Children. By Sir Lancelot Barrington Ward, K.C.V.O., Ch.M., F.R.C.S., Surgeon to H.M. The King. Second edition. Cloth. Price \$9. Pp. 333 with 161 illustrations. New York & London: Oxford University Press, 1937.

The preface contains the remark that the adult may safely be treated as a child but that the converse can lead only to disaster. To be successful in the abdominal surgery of children the surgeon must be familiar with certain diseases peculiar to the child, such as status lymphaticus, congenital pyloric stenosis, intussusception, and hernia of the umbilical cord. In this volume the genito-urinary system has been omitted by the author except as far as it touches the general surgery of the abdomen. Some chapters of the second edition have been rewritten and others amplified, the easily readable text is accompanied by numerous illustrations and four color plates,

at the end of each chapter is a short bibliography. A few opinions deserve special attention. Preoperative purgation, enemas and starvation should be abandoned, voiding of purgation is observed during the postoperative period, no ill effects from morphine have ever been noticed by the author, the rectal tube is considered useless, for appendectomy the use of the paramedian incision with lateral displacement of the rectus muscle is recommended, finally, he is convinced that one of the factors in successful abdominal surgery in the child is drainage. The smooth style, simplicity of presentation and good illustrations of this work will meet with instant approval by surgeons and may be wholeheartedly recommended.

Our Children in a Changing World. An Outline of Practical Guidance. By Erwin Wenberg, M.D., Professor of Neuro-psychiatry, Louisiana State University, with Henry E. Fritsch, Cloth. Price \$2. Pp. 232. New York: Macmillan Company, 1937.

Each year, more and more child guidance groups are being formed. These groups base their efforts on the belief that all children can be made useful members of society, that behavior disturbances which arise are the result of detrimental influences in the environment. The adlerian school believes that behavior problems cannot be satisfactorily solved without considering the underlying maladjustment in the child's personality. When children present behavior problems, it is the belief of this school that there must always be a successful adjustment of the child's entire personality rather than the elimination of a few unrelated symptoms. This book is written on the basis of that belief. There is first a discussion of the development of personality and the factors of environment. Next there is a presentation of the types of children, such as the lying, timid and fearful child. Bad habits and nervous symptoms are considered, followed by a discussion of education and corrective measures. Parents undoubtedly would benefit to a great extent by carefully reading a book of this type. It will be found useful also to teachers and social workers.

On Percussion of the Chest. Being a Translation of Auenbrugger's Original Treatise Entitled "Inventum novum ex percussione thoracis humani ut signo abstrusos interni pectoris morbos detegendi." [Vienna 1781.] By John Forbes, M.D. [London, 1824.] Introduction by Henry E. Sigerist. Boards. Price 75 cents. Pp. 31 with 2 illustrations. Baltimore: Johns Hopkins Press, 1936.

This is a reprint of the translation of Auenbrugger's original treatise by John Forbes in 1824, to which there is a brief introduction by Henry E. Sigerist. It took Auenbrugger seven years to work out his method, and half a century passed before the method had general adoption. In 1821 Forbes published a translation of the book by R. T. H. Laennec on auscultation. Five editions of that work were published between 1821 and 1838. The edition published in 1824 included also this translation of the treatise by Auenbrugger.

Disorders of the Blood. Diagnosis Pathology Treatment and Technique. By Lionel E. H. Whitby, C.V.O., M.C., M.D., Assistant Pathologist, The Bland Sutton Institute of Pathology, the Middlesex Hospital, and C. J. C. Britton, M.D., D.P.H., Assistant Pathologist, The Bland Sutton Institute of Pathology, the Middlesex Hospital, London. Second edition. Cloth. Price \$7.50. Pp. 582 with 72 illustrations. Philadelphia: P. Blakiston's Son & Co., 1937.

The first edition was published in 1935. The advances made in our study of the blood since that time are represented in this book by thirty-five extra pages and seven new illustrations and also some 400 changes in the bibliography. The authors point out that this edition stresses the value of classifying the anemias in terms of cell size and hemoglobin concentration. The place made for itself by the first edition is likely to be held by the new volume.

Maternal Deaths—The Ways to Prevention. By Iago Galdston, Secretary, Medical Information Bureau of the New York Academy of Medicine. Cloth. Price 75 cents. Pp. 115. New York: Commonwealth Fund, London: Oxford University Press, 1937.

In 1933 the Commonwealth Fund published a monograph entitled "Maternal Mortality in New York City, A Study of All Puerperal Deaths 1930-1932." This study was intended primarily for the medical profession. Galdston has taken the data obtained from this study and has adapted it to the public. There is no doubt about the justification for such a presentation because maternal welfare is not solely a medical problem.

Social and economic factors enter into it. The book is divided into chapters devoted to preventable deaths, antepartum care, the attendant at delivery, midwife practice, place of delivery, operative versus spontaneous delivery, cesarean section, anesthesia and analgesia, and abortion. In the last chapter the author discusses what can be done to bring about improvement in maternal welfare. In an appendix he discusses the community organization in Cleveland as an illustration of the type of medical organization which large communities can create to improve the quality of obstetric service rendered. This book has a definite mission and should help to bring about some improvement in the deplorable state of affairs that exist at present in this country and elsewhere in the care of parturient women.

Diagnosis and Non Operative Treatment of the Diseases of the Colon and Rectum. By Cottwald Schwarz M.D. Professor University of Vienna. Jacques Goldberger M.D. Consulting Physician Carlsbad and Charles Crocker M.D. Cloth. Price \$10.50. Pp 540 with 255 illustrations. New York: Paul B. Hoeber Inc. 1937.

This book emphasizes the importance of roentgenology and proctosigmoidoscopy in diseases of the colon and rectum. The diplooptic method of proctosigmoidoscopy is presented and recommended as superior to the methods now in general use. The illustrations obtained by the use of this method are excellent. The general discussions are clear and concise. Case reports are presented briefly and illustrate the text very well. Dietary management is given in detail. This is an excellent volume for the general practitioner and a valuable addition to the library of the specialist.

Die inneren Erkrankungen im Alter. Von Univ. Prof. Dr. Albert Müller Dehann. Paper. Price 24 marks. Pp 408 with 6 illustrations. Vienna: Julius Springer 1937.

There have been few books published on diseases peculiar to old persons, hence this exhaustive compilation should be valuable to both the practitioner and the student. Although the author presents little that is new, the diseases that may occur in old age are nicely arranged according to the various systems. The author had the rare privilege of having the late Professor Erdheim as collaborator. He had a large hospital practice, devoted almost exclusively to old persons, and his careful clinical studies were all checked by Professor Erdheim at necropsy. The pathologic and biologic phases of this subject are exceptionally well done. The problems of arteriosclerosis and hypertension and cancer are exhaustively handled. Contrary to most books from Vienna, treatment is given in full detail and with special emphasis. The text is clear and the illustrations are ample.

Not So Long Ago. A Chronicle of Medicine and Doctors in Colonial Philadelphia. By Cecil K. Drinker M.D. Sc.D. Professor of Physiology and Dean of the School of Public Health, Harvard University. Cloth. Price \$3.50. Pp 183 with 20 illustrations. New York: Oxford University Press. 1937.

The author's great great grandmother lived in Philadelphia and kept a diary from 1758 to 1807. She had many grandchildren, and the medical experiences of this large family were her primary concern. Many important physicians attended these children in their illnesses. In the diary, as here presented, the author intersperses much information between exact excerpts from the diary with the original English and spelling. The whole book makes a marvelous picture of the nature of medical practice in that time. Many famous physicians, including Benjamin Rush, William Shippen, John Bard and Philip Physick, pass through its pages. The book gives not only an excellent picture of the medical practice of its time but also an interesting insight into the beginnings and prosecution of the War of the Revolution.

Physicians' Guide Book for Mothers. By G. G. Keener M.D. Cloth. Price \$1. Pp 62. Klagsport, Tennessee: Southern Publishers Inc. 1936.

With much attention centered on the reduction of neonatal and maternal mortality, a variety of books concerning care during pregnancy have appeared. Simply outlined in a few brief pages, this book presents the essentials of antepartum and postpartum care. Mothers may find it of some help in following the advice of the physician. The instructions given are simple and easily followed, while the regular care of the physician is stressed.

Les Immunités locales. Par A. Besredka, professeur à l'Institut Pasteur. Paper. Price 35 francs. Pp 224. Paris: Masson & Co. 1937.

The subject of this book is local immunity in general as well as its manifestations, as viewed by the author, in the skin, the lungs, the pleura, the peritoneum, the meninges, the intestines and the spleen and in plants. The last chapter deals with local passive immunity. The presentation tends to be dogmatic and frequently the evidence brought forward in support of positive statements does not seem to be conclusive.

The Story of Motherhood. By Roy P. Finney M.D. Cloth. Price \$3. Pp 359 with 17 illustrations. New York: Liverlight Publishing Corporation. 1937.

This is another of the large number of books written in recent years to acquaint the public with the story of childbirth throughout the ages. The author is listed in the American Medical Directory as a urologist practicing in Spartanburg, S. C., but presumably he is also interested in obstetrics and the history of obstetrics. The contents of this book are essentially the same as those of the other books on this subject. To the sixteen illustrations in the text the author adds one of himself as a frontispiece. The book is well written.

A Medical History of Liverpool from the Earliest Days to the Year 1920. From the data collected by the late Thomas H. Blekerton Ch.M. F.R.C.S. Edited by H. Richard Blekerton and R. M. B. MacKenna. Cloth. Price 21s. Pp 313 with 81 illustrations. London: John Murray. 1936.

This handsome tome is a fine contribution to the history of medicine magnificently printed, illustrated and bound. Its detail, however, is so great that it must ever remain, except for those intimately concerned with Liverpool, a work of reference. It is supplemented with numerous tables of names of persons concerned with the development of the medical institutions of Liverpool and with a bibliography of the literature on the subject. On her record of the past, Liverpool looks forward most optimistically to the development of medicine in the future.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospital Services. Liability of County for Hospital Expenses of Indigents.—One Frank Palmer was a dependent poor person of Cache County, Utah. Between May 3 and May 19, 1934, he was treated at the plaintiff hospital, the county commissioners having authorized an operation for the removal of one of his toes. On May 19, Palmer was released from the hospital and taken to a hotel where he had previously resided. A few hours later, he became suddenly ill and the manager of the hotel made several unsuccessful attempts to get in touch with the county commissioners for authorization to return him to the hospital. Finally the county clerk procured an ambulance and had Palmer removed to the hospital for further attention. Two or three days thereafter, Palmer's leg was amputated and he remained in the hospital for several months. In September, a bill for four months hospitalization was presented to the county commissioners and later the county paid one third of the bill. The hospital then instituted suit to collect the other two thirds, or \$385. The trial court gave judgment for the county, and the hospital appealed to the Supreme Court of Utah.

The hospital contended first that the county clerk had authority in cases of emergency to authorize hospital care if the commissioners could not be reached. While, said the Supreme Court, it seems natural and necessary that some one should have authority to consign an emergency case to the hospital if none of the commissioners are available, the court could not say that the finding of the trial court that the county clerk had no such authority was not sustained by the evidence. The hospital further contended that the county had in fact recognized Palmer as an indigent and had already assumed his care, that the law imposed on the county a duty of caring for indigents, and that a third person who performed that duty may recoup the cost incident thereto much like a third person

supplying a wife with necessities for the family may sue a husband who has not expressly or impliedly contracted for the necessities. While the law does impose on county commissioners, said the court, the duty of caring for the indigent sick, a statute limits the levy that may be imposed for the care of indigents, county hospitals, etc., to one mill. Under this statute, the amount which could be raised was approximately \$23,000. The county introduced evidence to show that it would require, on the average, \$69,000 a year to take care of the indigents and that it therefore gets only one third of this amount from the one mill tax. A requirement imposed on an official or board to expend money, the court observed, is not a duty past the amount available. It was argued, however, that the hospital was entitled to its money as long as there were funds available. If this were true, the court said, it would mean that the funds would be exhausted by those who were first served, and those who came afterward could obtain no relief.

The patient's leg was not amputated until two or three days after his return to the hospital. In that time the hospital had an opportunity to get in touch with the commissioners. The hospital assumed, however, that it could collect for the expenses incident to caring for Palmer because the county had paid in full for the previous period. But, said the court, it could not base a claim on reliance on that fact. It may base a claim for hospitalization for the brief period it took care of the patient pending the time it could get authorization from the county, and if, during this period it was necessary to amputate the leg, it could do that and could charge for such hospitalization. But a person who gives relief in an emergency because the matter is too imminent to permit of the obtaining of authorization must at the first opportunity get in contact with those who are liable and obtain authorization for further care. If that is not given, he can recoup only for such services and care as are necessary to administer so as to put the patient in a condition in which he may be safely removed. He may obtain remuneration for such period. Having obtained the victim under an emergency, he does not have to relinquish him before it is safe to move him, even if the authorities fail to extend authorization. The hospital was remiss, in the opinion of the court, in not getting in touch with the commissioners as soon as possible after Palmer came to it instead of placing reliance on a former action of such commissioners.

The Supreme Court, however, remitted the case with instructions to take additional evidence on the question of whether the hospital had as a matter of fact endeavored to get in touch with the county before the amputation of the leg, if so, and it had not succeeded, how long after the amputation it was necessary to keep Palmer before it would be safe to move him. If the cost of hospitalization for such a period was more than the amount paid by the county, the hospital was to obtain judgment for such additional amount. If the trial court should find that the plaintiff failed to use reasonable efforts to contact the county commissioners before the amputation, then the original judgment was to stand.—*Cache Valley General Hospital v Cache County (Utah)*, 67 P (2d) 639

Paternity Judicial Notice of Landsteiner Blood-Grouping Test—In this bastardy proceeding, the plaintiff charged that the defendant, aged 70 years, was the father of her illegitimate child. The defendant denied having had intercourse with the plaintiff and further testified, in which testimony he was corroborated by his wife, that he had been impotent for a number of years. The trial court, with the consent of the parties, appointed a physician to make a Landsteiner blood grouping test of the plaintiff, the defendant and the baby. The physician did so and reported that the test placed the mother and the putative father in group O and the baby in group B. He testified that the baby could not be the issue of the plaintiff and the defendant. The trial judge who tried the case without a jury nevertheless entered a judgment in favor of the plaintiff. The defendant, the putative father, appealed to the district court of appeal, second district division 2, California.

The sole question before the court was whether or not there was substantial evidence to sustain the finding of the trial court. The law is settled said the court, that courts will take

judicial notice of all matters of science and common knowledge. Hence the court will take judicial notice of the Landsteiner blood grouping and the results derived therefrom on test, which the court described in the following language:

The Landsteiner blood groupings in parents and children are as follows:

(The letters signify the blood types of the respective individuals)

Groups of Parents	Groups of Children Possible	Groups of Children Not Possible
1 O x O	O	A B AB
2 O x A	O A	B AB
3 O x B	O B	A AB
4 A x A	O A	B AB
5 A x B	O A B AB	*
6 B x B	O B	A AB
7 O x AB	A B	O AB
8 A x AB	A B AB	O
9 B x AB	A B AB	O
10 AB x AB	A B AB	O

Briefly the Landsteiner blood grouping test operates in the following manner. There are three allelomorphous genes A, B and O which determine blood groups. There is one locus for these genes in each single pair of chromosomes and at this locus only one of the three genes can occur. A and B determine the presence of the agglutinogens A and B and O the absence of agglutinogen. In the formation of the germ cells the pairs of chromosomes separate and each germ cell contains only one of each pair and therefore only one of the three genes. From combinations of the three possible kinds of sperms with the three possible kinds of ova six different genotypes result. Genes A or B accordingly are dominant over O which means that if gene A or B is present even though combined with gene O then the individual will possess agglutinogen A or B.

The agglutinogens A and B cannot appear in the blood of a child unless present in the blood of one or both parents since they are inherited as mendelian dominants. If either parent belongs to group AB his or her genotype is AB so half the germ cells will contain gene A and half gene B. Every child will therefore possess at least one A or B gene and cannot belong to genotype OO or group O. On the other hand if either parent belongs to group O or genotype OO, all the children must possess at least one O gene so that children of group AB are impossible.

The medical profession, said the court, accepts the results of the Landsteiner blood-grouping test as conclusive evidence in cases in which it shows nonpaternity. The physician who made the blood-grouping tests in the present case testified that the tests showed that the defendant could not be the baby's father, hence the finding that the defendant was the father of the baby was not supported by substantial evidence. The judgment of the trial court was therefore reversed.

In passing, the court said, the blood-grouping test requires only a few drops of blood, is painless and in no way is prejudicial to health. Since the charge of paternity is one easy to make and very difficult to disprove, it would tend to simplify this problem, when it is presented to the courts for determination, and would be a distinct advance in the science of jurisprudence, if the California legislature would adopt an amendment to the Code of Civil Procedure providing that whenever it shall be relevant to the prosecution or the defense in an illegitimacy action the trial court may direct the complainant, her child and the defendant to submit to one or more blood tests to determine whether or not the defendant can be excluded as being the father of the child and making the result of the test admissible in evidence only in cases in which definite exclusion is established. Such a statutory provision has been enacted in New York and Wisconsin, the court said.—*Araus v Kalensnoff (Calif)*, 67 P (2d) 1059

Society Proceedings

COMING MEETINGS

- American Orthopsychiatric Association Chicago Feb 24-26 Dr Norville C La Mar 210 East 68th St New York Secretary
- Annual Congress on Medical Education and Licensure Chicago Feb 14-15 Dr W D Cutter 535 North Dearborn St Chicago Secretary
- Federation of American Societies for Experimental Biology Baltimore March 30-April 2 Dr D R Hooker 19 West Chase St Baltimore Secretary
- Pacific Coast Surgical Association Los Angeles Feb 22-23 Dr H Glenn Bell University of California Hospital San Francisco Secretary
- Southeastern Surgical Congress Louisville Ky March 7-9 Dr B T Beasley 701 Hunt Bldg Atlanta Ga Secretary
- Tri-States Medical Association of the Carolinas and Virginia Asheville N C Feb 21-22 Dr J M Northington 894 Professional Bldg Charlotte N C Secretary

Current Medical Literature

AMERICAN

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American Journal of Psychiatry, New York

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- Correlations of Behavior and Neuropathology in Case of Cerebral Palsy from Birth Injury A Gesell and H M Zimmerman New Haven Conn.—p 505
- Puerperal Psychoses and Their Sequels L J Karnosh and J M Hope Cleveland—p 537
- Development of Family Care in New York State H G Hubbell Newark N Y—p 551
- Mental Reactions and Their Management in Patients with Cardiac Disease P H Drewry Jr and J H Wall White Plains N Y—p 561
- *Behavior of Children Receiving Benzedrine C Bradley East Providence R I—p 577
- Effect of Benzedrine Sulfate on Intelligence Scores of Children M Mohltech Philadelphia and A K Eccles Jamesburg N J—p 587
- Psychiatric Study of Recidivists C B Thompson New York—p 591
- Mental Changes Following Removal of Right Cerebral Hemisphere for Brain Tumor S N Rowe Pittsburgh—p 605
- Defects of Intelligence from Focal Lesions Within Central Part of Left Cerebral Hemisphere L B Alford St Louis—p 615
- *Sodium Amytal as Substitute for Tube Feeding W H Foley and V P Rossignoli Providence R I—p 639
- Primary Affect Hunger D M Levy New York—p 643
- Child Analysis as Technique in Investigation of Mental Mechanisms Illustrated by Study of Enuresis Margaret W Gerard Chicago—p 653
- Child Psychiatry J S Plant Newark N J—p 665
- Some Therapeutic Principles Applicable to Psychiatric Work with Children F H Allen Philadelphia—p 671
- Evaluation of Treatment of Problem Children as Determined by Follow Up Study H W Potter and Henriette R Klein New York—p 681
- Problem Children Growing Up L Kanner Baltimore—p 691
- Mental Changes Including Aphasia in a Patient with Sickle Cell Anemia Beulah Bosselman and S H Kraimes Chicago—p 709

Behavior of Children Receiving Benzedrine—To observe the effect of benzedrine on the behavior of children, Bradley selected thirty patients, already in the hospital, suffering from behavior disorders. Every child in this group had already been under observation for at least a month. In addition to routine observation and recording of behavior by ward nurses and teachers, each child was observed for three weeks by a special psychiatric nurse. During the second week of observation a daily dose of benzedrine was administered to each patient on arising. Later the records of his behavior during this week were compared with those of the week prior and the week following. The most spectacular change in behavior brought about by the use of benzedrine was the improved school performance of approximately half the children. These patients were of good intelligence and were receiving adequate attention for any personality disorders that might affect their school progress. The other children of the group did not show this striking response in school, but most of them responded in other ways to the medication. Only half of the group showing favorable mood changes shared to a notable degree in the school improvement, especially in arithmetic performance, since speed of comprehension, degree of accuracy and quantity of output were all favorably affected. It appears paradoxical that a drug known to be a stimulant should produce subdued behavior in half of the children, but it should be borne in mind that portions of the higher levels of the central nervous system have inhibition as their function and that stimulation of these portions might produce the clinical picture of reduced activity through increased voluntary control. In spite of the results obtained it seems wise to await more complete knowledge of the action of benzedrine before recommending its clinical use in behavior problem children. The drug should be administered only by the experienced physician trained in child psychiatry.

Sodium Amytal as Substitute for Tube Feeding—Foley and Rossignoli observed recently that sodium amytal given either intravenously or intramuscularly eliminated the necessity

of tube feeding, as patients invariably took nourishment after its administration. They experimented successfully with ten patients: five had schizophrenia and two had postpartum psychosis with a schizophrenic background, one had pulmonary tuberculosis with a toxic psychosis following a first stage thoracoplasty, one was diagnosed as having psychosis with cerebral arteriosclerosis and one, an extremely active and resistant patient, was treated for dementia paralytica. In the cases in which the drug was effective, the ideal reaction was observed in the depressed catatonic reaction rather than in the active manic state, regardless of the type of psychosis dealt with. When the drug was given intravenously the patients took solids or liquids immediately after the needle was withdrawn from the vein, and the desire to eat and also talk usually lasted from ten to fifteen minutes. When injected intramuscularly, the patient began to take nourishment in from fifteen to thirty minutes afterward and the effects lasted from fifteen to thirty minutes. The optimal dose for the required action has not been satisfactorily decided. The doses employed varied from $3\frac{3}{4}$ to $7\frac{1}{2}$ grains (0.25 to 0.5 Gm) when given either intravenously or intramuscularly. The desired dose causes a semiconscious state and is determined only after one or two trials. Whether or not these ten patients might have progressed more favorably and eaten sooner following tube feeding is doubtful. However, under sodium amytal they all ate, talked, gained weight, received a well balanced diet and did not have diarrhea. They were less resistive and negativistic and also indirectly obtained needed rest and sleep.

Am J Roentgenol & Rad Therapy, Springfield, Ill

38 821 966 (Dec.) 1937

- Carcinoma of the Larynx Janeway Memorial Lecture D Quick New York—p 821
- Epidermoid (Cholesteatoma) Lying Under Scalp and Outside Pericranium Case N C Norcross Philadelphia—p 854
- Excretion of Foreign Substances by Liver and Question of Visualization of Gallbladder in Presence of Jaundice R Ottenberg New York—p 859
- Physiologic Principles in Roentgenographic Visualization of Biliary Tract After Injection of Lipiodol H Doubilet New York—p 863
- Emptying of Normal Gallbladder M L Sussman, New York—p 867
- Cholecystography and Its Correlation with Gallbladder Pathology R Colp New York—p 872
- Regional Jejunitis C Gottlieb and S Alpert New York—p 881
- *Localized Nonspecific Ulcerative Enteritis with Some Unusual Features R T Taylor Los Angeles—p 884
- Chronic Adhesive Spinal Arachnoiditis Case C W Schwartz and E M Deery New York—p 887
- Atherosclerosis Hyperplastica Intra Ossea N A Podkaminsky Kharcow U S S R—p 889
- Prevention and Treatment of Roentgen Injuries of the Skin H Schmitz Chicago—p 893
- *Effect of Gamma Radiation on Mitosis S Warren Boston—p 899
- Effect on the Percentage Depth Intensity of Increase in Voltage Filtration and Skin Target Distance (150 300 Kilovolts [Peak]) C L Randall Buffalo—p 903
- Radiologic Applications of Geiger Muller Counter C B Braestrup E J Murphy and M D Whitaker New York—p 915

Localized Nonspecific Ulcerative Enteritis—Taylor cites two cases of localized or "regional" nonspecific ulcerative enteritis which in their initial stages seemed to correspond to those described by Chron, Ginzburg and Oppenheimer, and others, but which failed to follow the orthodox path and were not cured by surgical resection. The feature of interest in the first case is not that nonspecific ulceration was found in both the small and the large intestine but that resection in a patient with nonspecific ileocolitis resulted in only temporary cure of short duration and that this patient subsequently had generalized ulceration throughout most of the colon. Following resection of the diseased segment in the second patient the colon and portions of the lower ileum were subsequently involved completely.

Effect of Gamma Radiation on Mitosis—Warren has determined the frequency of the various stages of cell division in Walker carcinoma No 256 after gamma irradiation. From 15,000 to 24,000 cells were counted and the number and stages of mitoses noted. The counts were made at a magnification of 900 diameters and questionable forms were studied under higher power. Some stages of mitosis could not be classified positively, and these were placed in the unknown group. In the nonirradiated tumor, about twenty mitoses occur per thousand cells and are fairly evenly divided as to stage, except for a moderate preponderance of cells in metaphase. Within one

and a half hours of the onset of irradiation a sharp drop in the number of mitoses occurs, reaching its nadir in the time interval from one and a half to ten and a half hours later. The proportion of cells in prophase tends to rise as this drop in mitotic activity occurs and falls about twenty hours after cessation of irradiation. Since the rise of prophases is only proportionate and actually a marked decrease in number occurs, the probability is that certain mitoses do not progress to completion, owing to death of the cell or arrest of karyokinesis. Since a piling up of numerous mitoses does not occur at any one stage, since the reduction in total number occurs promptly, and since the reduction in number appears in all stages at about the same time, one may assume that the earliest steps in mitosis are inhibited, probably even before the visible changes of prophase can be noted. Appearance of abnormal mitoses (multipolar spindles, lagging chromosomes) are not helpful, since they occur not infrequently in nonirradiated tumors of this type and since there is marked variation in both their absolute and their proportionate frequency. Radon does not differ essentially from roentgen radiation in its effect on mitosis.

American Journal of Surgery, New York

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- Emergency Treatment of Fractures of Lower Extremities E P Palmer, Phoenix Ariz—p 461
Fractures of Scapula and Ribs R T Findlay New York—p 489
Fractures of Upper End and Shaft of Humerus D Gordon New York—p 495
Fractures of Carpal Bones L E Snodgrass Philadelphia—p 539
Fractures of Metacarpals Metatarsals and Phalanges D L Rider Chicago—p 549
Fractures of Sternum and Thyroid Cartilage W G Stuck San Antonio Texas—p 560
Fractures of the Spine J Dunlop Pasadena Calif—p 568
Fracture Dislocations of Cervical Spine W G Crutchfield Richmond Va—p 592
Fractures of Dorsal and Lumbar Vertebrae W A Rogers Boston—p 599
Nonoperative Treatment for Fracture of Neck of Femur G W Leadbetter Washington D C—p 612
Operative Treatment of Hip Fractures Intracapsular F J Cotton Boston—p 619
Nonoperative Treatment of Fractures of Shaft of Femur R R Impink and W E Lee Philadelphia—p 629
Operative Treatment of Fractures of Shaft of Femur J H Wagner, Pittsburgh—p 648
Osteochondritis Dissecans Description of Stages of Condition and Its Probable Traumatic Etiology F M Conway New York—p 691
Fractures of Tibia Involving the Knee Joint Bumper or Fender Fractures J A Dickson Cleveland—p 700
Fractures of the Ankle F D Dickson Kansas City Mo—p 709

American Review of Tuberculosis, New York

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- Bronchiectasis Associated with Tuberculous Bronchial Obstruction S S Cohen Oak Terrace Minn and G K Higgins Minneapolis—p 711
Massive Pulmonary Atelectasis Following Bronchial Obstruction in Tuberculosis S Sanes and W S Smith Buffalo—p 727
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Silicotuberculosis D M Brumfield and L U Gardner Saranac Lake N Y—p 757
Effect of Radio Short Waves on Tubercle Bacilli and Tuberculosis H J Corper M L Cohn M G Simpson and C Bower Denver—p 763
*Effect of Contagious Disease on Pulmonary Tuberculosis and on Tuberculin Reaction in Children J P Nalbant Northville Mich—p 773
Streptococcal Throat Infections in Tuberculous Children Gertrude F Mitchell Northville Mich—p 778
Tuberculosis Work Among Negroes in Philadelphia with Especial Reference to the Negro Bureau H D Brown Philadelphia—p 787
Bacteriologic Examination of Sterilized Sputum Elena I Politova Moscow U S S R—p 799

Effect of Contagious Diseases on Pulmonary Tuberculosis—Nalbant studied 118 children convalescing from tuberculosis who acquired acute contagious diseases. No definite evidence was found in support of the prevalent belief that measles, chickenpox, whooping cough, mumps, scarlet fever and diphtheria have a deleterious effect on tuberculous lesions in the lungs of children or that the foregoing diseases depress allergy to tuberculin in a child with healed or active tuberculosis. Further data were discovered to strengthen the contention that exacerbations or remissions are fairly common occurrences during the course of the childhood type of tuberculosis and that they may occur in the presence or absence of intercurrent contagious diseases.

Anatomical Record, Philadelphia

70 1 158 (Dec) 1937

- Relation of Sciatic Nerve and of Its Subdivisions to Piriformis Muscle. L E Beaton and B J Anson Chicago—p 1
Effects of Jarring on Embryogeny of Chick Embryos K A Stiles and R L Watterson Cedar Rapids Iowa—p 7
Cytologic Abnormalities in Oocytes of the Three Week Rattens Ovary Mary Elizabeth Snider Providence R I—p 13
Functional Homeografts of Rat Adrenal Gland Grown in Vitro Lydia Lux G M Higgins and F C Mann Rochester Minn—p 29
Origin of Sympathetic Trunks in Chick Embryo D S Jones Minneapolis—p 45
Rare Cardiac Anomaly W S Hammond Ithaca N Y—p 67
Effect of Fat in Simplified Diets on Reproductive Organs of Female Albino Rat During Gestation E C Meeder Minneapolis—p 73
Experimentally Produced Sterile Gonads and the Problem of Origin of Germ Cells in Chick Embryo B H Willier Rochester N Y—p 89
Studies on Reproductive System of Alligator I Effects of Prolonged Injections of Pituitary Whole Gland Extract in Immature Alligator T R Forbes Rochester N Y—p 113

Archives of Dermatology and Syphilology, Chicago

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- Multiple Pigmented Nevus Study of Origin of Nevus Cell M H Ebert Chicago—p 1
Epidermolysis Bullosa Dystrophica (Recessive Type) Report of Case L Tulipan New York—p 22
*Lichen Planus of Eyelids H E Michelson and C W Laymon Minneapolis—p 27
Familial Multiple Lipomas Report on Family A A Humphrey and P C Kingsley Battle Creek Mich—p 30
*Epilating Action of Ethyl Gasoline H J Templeton G Michiel and J M Key Oakland Calif—p 35
Management of Metastatic Carcinomatous Glands in Neck W H Guy and F M Jacob Pittsburgh—p 43
*Leukopenic Index Test in Atopic Dermatitis E M Rusten Minneapolis—p 52
Measurement of Roentgen Therapy for Tinea Capitis Correlation of Epilation Dose with the Roentgen C G Lane and G M Crawford Boston—p 62
Stomatitis Venenata Report of Case of Sensitivity of Mucous Membranes and Skin to Oil of Anise A B Loveman Louisville Ky—p 70

Lichen Planus of Eyelids—Some areas of the body seem immune to the invasion of certain diseases. This appears to be true of the eyelids in lichen planus, but Michelson and Laymon saw five patients in whom the eyelids were the seat of unmistakable lesions of lichen planus. Three types of lesions of lichen planus on the eyelids were observed. 1 The classic lilac-colored slightly delfed papules with filigree scaling were associated with similar lesions on the body. 2 Papules were so arranged as to make the typical annular or small medallion like plaques which are often seen on the glans penis. Patients with this type had other annular lesions on the body. 3 Two patients had lesions of the eyelids which were unique. They were brunet women aged 29 and 32. The upper eyelids were discolored with a sepia-brown retiform eruption, which was not made up of elevated papules, although in the skin of the network were small knobs which could have been papules previously. The eruption caused no symptoms but was gradually extending to all four lids and was becoming darker, constituting a cosmetic deformity. In one of these cases a small bit of tissue was excised, and on microscopic examination it showed the characteristic bandlike infiltration of lichen planus. The rest of the skin and the mucous membranes were free from eruption in both cases. The eruption on the eyelids was identical with areas of melanotic staining seen in certain patients with lichen planus in the late stages of regression. This form of lichen planus of the eyelids could easily be ignored as a variant of that disease or might be diagnosed as erythema ab igne. Conjunctival lesions are identical with those seen on the buccal or on the genital mucosa.

Epilating Action of Ethyl Gasoline—Templeton and his associates carried out a series of experiments which show that temporary loss of hair results when tetra-ethyl lead gasoline substance is applied to the hairy skin of experimental animals and that the animal dies if such applications are continued over a sufficient period. Although they are not certain that this phenomenon has any bearing on loss of hair in human beings, they report a case of alopecia areata (totalis) which aroused their interest in the subject. The patient worked for four days around and under an automobile, removing greases and oils from the motor and chassis by means of gasoline atomized

through a spray gun. He ascertained later that the gasoline used was treated with tetra-ethyl lead. It was not the heavily treated variety sold at a premium. Three days after completing this job he noted sudden loss of the hair of his left eyebrow, most of the right eyebrow and the hair from about one third of his scalp. Within a month two thirds of the hair on his scalp had fallen out and by the end of ten weeks he had lost every hair on his body. From their experiments they conclude that, when gasoline containing 0.03 per cent tetra-ethyl lead and 0.02 per cent ethylene dibromide is applied to the skin of rats, guinea pigs or rabbits, loss of hair results in the areas to which the gasoline has been applied and in varying degrees lateral to the point of application. Regrowth of hair is observed in about three or four weeks and is complete in about seven weeks. If the stronger ("premium") gasoline, containing larger amounts of tetra-ethyl lead, is used for a week approximately one fourth to one third of the animals die. Control animals treated with kerosene or plain gasoline are not affected. Further work is being done to determine which component or combination of components of the tetra-ethyl lead gasoline is responsible.

Leukopenic Index Test in Atopic Dermatitis—Rusten applied the leukopenic index test and cutaneous tests to nineteen patients from 11 to 30 years of age and having atopic dermatitis. Of 248 foods tested, 20 per cent gave compatible curves and 10 per cent of these produced symptoms when tried clinically, 50 per cent gave indeterminate curves and 35 per cent of these caused symptoms. 30 per cent gave incompatible curves and 50 per cent of these caused pruritus or increase of eruption. The conclusion is that the leukopenic index test is of value in atopic dermatitis only so far as foods are concerned and, although food produced some symptoms in 75 per cent of the patients studied, they were rarely the sole cause of the eruption. The results of studies of the white blood cells must be interpreted as are those of other laboratory tests, with relative percentages of accuracy, dependent on many technical factors and clinical observations.

Archives of Ophthalmology, Chicago

18 887 1064 (Dec.) 1937

- Chiasmal Syndromes Produced by Lesions in Posterior Fossa H P Wagener and P L Cusick Rochester Minn.—p 887
Muscular Anomalies and Amblyopia Practical Consideration J W White New York—p 892
Lever Action Operation for Intracapsular Extraction of Cataract K C Dutt Sonpur Ray India—p 897
Effects of Dimetrophenol on Permeability of Capsule of Lens W E Borley and M L Tainter San Francisco—p 908
Significance of Foveal Depression G L Walls Detroit—p 912
Chancere of Upper Eyelid in Infant Two Months of Age Report of Case, A Appelbaum New York—p 920
Use of Iodized Poppy Seed Oil in Ophthalmology T J Dimitry New Orleans—p 926
Case of Mixed Tumor of Lacrimal Gland with Retinal Folds and Choroidal Detachment Which Disappeared After Removal of Growth J Ziporkes New York—p 933
Eugenic Significance of Retinitis Pigmentosa W Allan Charlotte N C—p 938
*Importance of Diet in Etiology and Treatment of Tobacco Alcohol Amblyopia F D Carroll New York—p 948
Intra Ocular Invasion by Larva of Ascaris Report of Case with Unusual Complications F P Calhoun Atlanta Ga.—p 963
Neurogenic Origin of Choroidal Sarcoma Georgiana Dorrah Theobald Oak Park Ill.—p 971
Surgical Treatment of Strabismus Review of Recent Literature M C Wheeler New York—p 1000

Diet in Treatment of Tobacco-Alcohol Amblyopia—Carroll informed eight patients, who had tobacco-alcohol amblyopia, of the nature of their disease, of the usual treatment for this type of amblyopia and of the fact that on certain conditions they could enter the hospital without charge to them. The conditions were (1) that they should continue to smoke and drink as much as they had while contracting the disease and (2) that they must eat what was given them. The patients have been observed for at least one year. One of the eight patients did not improve. She had atrophy of the papillomacular bundle of the optic nerve, and vision remained stationary. All the other patients showed very satisfactory results and all have vision for reading. The speed of recovery seemed to be at least as good in these patients as in patients previously studied who abstained from tobacco and alcohol. The diet

that the patients were given was high in vitamin B, well balanced, adequate in all respects and supplemented by powdered brewers' yeast in doses of two tablespoonfuls five times daily, vegex (a brewers' yeast extract) in doses of one teaspoonful three times daily and wheat germ (Embo) in doses of four tablespoonfuls three times daily. They were also given liver extract intramuscularly in doses of 5 cc several times weekly and cod liver oil in doses of 1 ounce (30 cc) daily. The author concludes that tobacco alcohol amblyopia is perhaps not the result of a deficiency state but that diet does play an important part.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

18 737 800 (Dec.) 1937

- Short Wave Treatment of Endocrine System Diencephalon and Mesencephalon J Samuels Amsterdam Netherlands—p 741
Effect of Ultraviolet and Visible Rays on Carbohydrate Metabolism L Pincussen Chicago—p 750
*Ultraviolet Irradiation in Secondary Anemia R Kovacs New York—p 756
Relation of the Council on Medical Education and Hospitals to Standardization of Schools for Physical Therapy Technicians O N Andersen Chicago—p 764
X Ray Treatment of Inflammations A F Tyler, Omaha—p 766
Ultraviolet Irradiation of Erysipelas in Infants S Starr Brooklyn—p 772

Ultraviolet Irradiation in Secondary Anemia—Kovacs carried out a controlled experimental investigation of the effects of a definite dose of ultraviolet irradiation on 113 hospitalized patients with secondary anemia. All the patients including the controls were on the same diet. The controls did not receive treatment of any kind during the two weeks devoted to the tests nor did the patients receive any medication that would tend to activate the hemopoietic organs. Attention was concentrated to that part of the blood picture which involved the hemoglobin, the red cells and the white cells. Ultraviolet from the quartz mercury high pressure arc lamp accelerated the production of hemoglobin. The rate of acceleration appeared to be greater if the complete spectrum was used. Acceleration was not so great when only the longer ultraviolet through a Corex D filter was employed. Ultraviolet radiation increased the number of red cells and the increase appeared to be independent of the portion of the ultraviolet spectrum used. Ultraviolet radiation increased the number of white cells, but individual results varied so greatly within the groups that final conclusions must be reserved until after further experimentation. The effects on the blood picture as well as on the general condition indicate that ultraviolet irradiation is an aid in the treatment of secondary anemia.

Canadian Public Health Journal, Toronto

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- Survey of Incidence of Venereal Diseases in Toronto in 1937 G Bates, Toronto—p 575
Lead and Arsenic Content of Canadian Domestic Tobaccos F A J Zeidler and W J Wagner Toronto—p 582
Sexual Sterilization in Alberta Eight Years Experience 1929 to May 31 1937 R R MacLean Ponoka Alta and E J Kibblewhite Edmonton Alta—p 587
Prenatal Nursing Supervision Eslier M Beith Montreal—p 591
Puerperal Sepsis and Its Prevention R Hare Toronto—p 596

Indiana State Medical Assn Journal, Indianapolis

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- Fluid Balance and Dehydration in Prevention and Control of Eclampsia J O Arnold Philadelphia—p 617
Polypoid Disease of the Colon L A Bue Rochester Minn.—p 622
Treatment of Colles Fractures G J Garceau Indianapolis—p 627
Common Neoplasms of the Skin H J Pierce Terre Haute—p 631
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Three Year Study of Student Nurses 1935 1937 Mary A Meyers Indianapolis—p 638

Iowa State Medical Society Journal, Des Moines

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- Brucellosis L R Woodward Mason City—p 609
Fracture Demonstration W Scott Sioux City—p 614
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Lesions of the Esophagus A M Gordon Des Moines—p 621
X Rays Become an Adjunct to Otolaryngologic Therapy L G Howard Council Bluffs—p 625
The Bursitis of the Foot, J Wolf Davenport—p 632

Johns Hopkins Hospital Bulletin, Baltimore

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- Paroxysmal Hypertension and Other Clinical Manifestations Associated with Benign Chromaffin Cell Tumors (Pheochromocytomas) J E Howard and W H Barker Baltimore—p 371
- Primary Carcinoma of Trachea with Cutaneous Carcinomatosis E L Keeney Baltimore—p 411
- Congenital Cardiac Malformation Presenting Complete Interruption of Isthmus Aortae with Transposition of Great Arteries L P Ham burger Jr Baltimore—p 421

Journal of Bacteriology, Baltimore

34 567 674 (Dec) 1937

- Growth and Respiration of Some Soil Bacteria in Juices of Leguminous and Nonleguminous Plants D W Thorne and P E Brown Ames Iowa—p 567
- Apparatus for Measuring Turbidity of Bacterial Suspensions Elizabeth V Wright and H Kersten Cincinnati—p 581
- Relation of Peptone to Production of Hemolysin by Streptococci F Smith Montreal—p 585
- Influence of Various Substances and Conditions on Streptococcal Hemolysin F Smith Montreal—p 603
- Classification of Acid Fast Bacteria Ruth E Gordon New York—p 617
- Identity of 'Bacillus Innuiticus' (Klein Schmidt) and Bacillus Paratuberculosis (Bienstock) I C Hall and Dorothy Ridgway Denver—p 631
- Effect of Soft X Ray Irradiation on Bacteriophages Elizabeth V Wright and H Kersten Cincinnati—p 639
- *Differential Medium for Meningococcus and Gonococcus Sadie F Bailey Pittsburgh—p 645

Differential Medium for Meningococcus and Gonococcus—Bailey describes a medium consisting of whole serum from which the fermentable substances and diastase have been removed and to which have been added a concentrated broth containing inorganic salts and a carbohydrate and indicator. Differential identification between meningococci and gonococci can usually be established in from twelve to twenty-four hours.

Journal of Experimental Medicine, New York

66 653 826 (Dec) 1937

- Epizootic Disease of Ferrets Caused by Filtrable Virus C A Slanetz and H Smetana New York—p 653
- Comparative Effects of Neutrons and X Rays on the Whole Body J H Lawrence Berkeley Calif and R Tennant New Haven Conn—p 667
- *Studies on Immunity in Type of Human Allergy (Hay Fever) Serologic Response of Nonsensitive Individuals to Pollen Injections R A Cooke Mary Loveless and A Stull New York—p 689
- Calcium Content of the Kidney as Related to Parathyroid Function W Donohue C Spingarn and A M Pappenheimer with assistance of Nancy Downes New York—p 697
- Effect of Increased Antipneumococcal Immunity on Inception of Experimental Lobar Pneumonia in Dog O H Robertson Chicago—p 705
- Spotted Fever. III Identification of Dermacentor variator Rickettsi and Its Differentiation from Nonpathogenic Rickettsiae in Ticks H Pinkerton and G M Hass Boston—p 729
- Experimental Local Bladder Edema Causing Urine Reflux into Ureter and Kidney J Auer and L D Seager St. Louis—p 741
- Unilateral Inhibition of Renal Schwartzman Phenomenon Following Injection of Bacterial Filtrate into Renal Artery A R Moritz and D Weir Cleveland—p 755
- Experimental Study of Protective Inoculation with Heat Killed Tubercle Bacilli E L Opie and J Freund New York—p 761
- Studies on Haemophilus Influenzae. II Comparative Study of Virulence of Smooth Rough and Respiratory Strains of Haemophilus Influenzae as Determined by Infection of Mice with Mucin Suspensions of Organism Caroline A Chandler L D Fothergill and J H Dingle Boston—p 789
- Prothrombin Deficiency and Bleeding Tendency in Liver Injury (Chloroform Intoxication) H P Smith E D Warner and K M Brinkhaus Iowa City—p 801

Immunity in Type of Human Allergy (Hay Fever)—Cooke and his co-workers found that large injections of ragweed pollen extract into normal nonsensitive volunteers did not produce a sensitization to ragweed. A group of volunteers in whose skin many reactions were induced by injections of ragweed extract mixed with ragweed sensitive serum failed to show any serologic changes. The theory that the immune substance found in the serum of treated ragweed sensitive cases was due to the reaction or to some substance created by it and not to the ragweed alone was not upheld. On the contrary, in another group of volunteers who received larger amounts of ragweed but no sensitive serum, serologic changes were induced resembling those previously observed to occur in ragweed sensitive patients after treatment. They were demonstrable by an inhibition of the immediate reaction and by interference with the neutralization of sensitive serum by its antigen.

These serologic changes are therefore independent of the specific reaction characteristic of this type of allergy. The inhibiting factor was found to be related to the pseudoglobulin fraction of the serum and was shown to be specific.

Journal of Lab and Clinical Medicine, St Louis

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- Thyroid Gland and Hematopoiesis. II Effect of Thyroid Extract Liver Extract and Iron on Anemia of Myxedema J C Sharpe and J D Bisgard Omaha—p 219
- Hyperinsulinism. Report of Second Case with Anatomic Findings E Ziskind and W A Bayley Los Angeles—p 231
- Control of Intractable Clinical and of Total Experimental Diabetes with Protamine Insulin W H Nadler and Bertha L Isaacs Chicago—p 241
- Meningococcus Antitoxin. Laboratory and Therapeutic Status N S Ferry Detroit—p 252
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- Modification of Krasnogorski Method for Stimulating and Measuring Secretion from Parotid Glands in Human Beings J E Finesinger and Grace Lubin Finesinger Boston—p 267
- Determination of Total Fixed Base in Tissue Cornelia T Snell and I N Kugelmass New York—p 274
- New Method of Staining Spirochetes and Bacteria in Smears G Steiner New Orleans—p 293
- Advantage of Stained Antigens in Diagnostic Agglutination Test for Brucella Infections R D Minster Boise Idaho—p 298
- Improved Technic for Biliary Drainage F C Forsbeck Lansing Mich—p 310
- Simple Method for Demonstration of Spirochetes in Frozen Sections G Steiner Detroit—p 315
- Analysis of Renal Calculi J Kamlet Brooklyn—p 321

Medical Bull of Veterans' Adm, Washington, D C

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- Interpretation of Roentgenograms of Cardiac Contours and Measurements L M Maguire—p 207
- Treatment of Hay Fever and Ivy Poisoning by Local Desensitization with Sodium Oleate and Salts of Other Unsaturated Fatty Acids E W Lazell—p 216
- Protamine Zinc Insulin in Treatment of Diabetes H Freed—p 220
- *Vitamin Deficiency as an Etiologic Factor in Central Neuritis D J Sullivan and A Simon—p 228
- *Hypoglycemia as Cause of Seizures in General Paralysis L Birnbaum and J A Wood—p 236
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- Mental Changes in Intracranial Neoplasms F J Imburgia—p 267
- Alveolectomy Prosthesis J Mitchell—p 270

Vitamin Deficiency as Factor in Central Neuritis—The picture of central neuritis described by Meyer is a terminal state, and Sullivan and Simon believe it to be the result of prolonged avitaminosis, particularly a vitamin B₁ deficiency. No abnormalities are found grossly in the brain. The microscopic changes involve the ganglionic cells of the brain and spinal cord. This is characterized by a central chromatolysis, lateral displacement of the nucleus and swelling of the cell body. These changes are most marked in the large and medium size pyramidal cells of the cortex, the oculomotor nucleus, the nucleus ambiguus, the ventral horn motor cells and perhaps the lateral horn cells. The neuropathology is of a degenerative type, so that the term 'central neuritis,' which suggests an inflammation, is a misnomer. 'Central neuritis' occurs in a variety of conditions, such as Korsakoff's psychosis, pellagra, alcoholic polyneuritis, alcoholic encephalopathy, polyneuritis of pregnancy and acrodynia. Toxins and infections are not the primary etiologic factor in the causation of this syndrome. Vitamin deficiency is the important etiologic basis for this disorder, and apparently vitamin B₁ is the essential one. A high vitamin diet with administration particularly of vitamin B₁ (antineuritic) is therapeutically indicated. Three cases with clinicopathologic data are presented.

Hypoglycemia as Cause of Seizures in Dementia Paralytica—Birnbaum and Wood studied the sugar tolerance curves of nine parietic patients who had seizures. Abnormal curves and sharp drops in hypoglycemic levels were observed in all cases. The average difference between the highest and lowest sugar levels of these patients was much greater than

that of the controls. Three patients had symptoms of seizures while their blood sugar was at hypoglycemic levels, these symptoms cleared as the level of the blood sugar rose. Therapy was attempted with one patient whose frequent seizures made him a suitable subject. A high fat, low carbohydrate diet (ketogenic) resulted in an increased number of seizures. Intramuscular injections of anterior pituitary extract in various doses (while on a normal diet) caused a reduction in the number of seizures from an average of thirty seizures weekly to an average of fifteen seizures weekly. A 25 per cent solution of dextrose given intravenously in a dose of 40 cc resulted in immediate cessation of seizures in a patient who was having a series of seizures. The seizures did have some relation to altered sugar metabolism in these patients.

Medicine, Baltimore

16 351 492 (Dec.) 1937

Pneumothorax Treatment of Pulmonary Tuberculosis E H Rubin New York—p 351

New England Journal of Medicine, Boston

217 899 932 (Dec 2) 1937

Major Injuries to the Spine W J Mixer Boston—p 899
Industrial Insurance Aspect of Traumatic Surgery J H Shortell Boston—p 904

*Treatment of Burns with Compound of Aniline Dyes R H Aldrich Boston—p 911

Chronic Hemolytic Anemia with Paroxysmal Nocturnal Hemoglobinuria Study of Mechanism of Hemolysis in Relation to Acid Base Equilibrium T H Ham Boston—p 915

Treatment of Burns with Compound of Aniline Dyes—Aldrich maintains that there is no assurance that mere spraying with aniline dyes will prevent mortality from burns. Their use makes treatment easier, but in the combating of the shock, in the constant attention paid to the eschar and in the nursing care and the diet, great efforts are necessary. In patients with extremely severe burns, blood transfusions should be used frequently to help combat infection and to give the patient added powers of healing. While the new combination of dyes is as superior to gentian violet as gentian violet is to tannic acid, it is not the final answer to all the problems presented by a burned patient. A burn should be rightly considered as an infected surgical lesion and that infection rather than absorption of a split protein causes death, for where there is no infection there is no toxemia.

Oklahoma State Medical Assn. Journal, McAlester

30 425 466 (Dec.) 1937

Food Allergy Value of Leukopenic Index in Food Sensitive Patients R M Balyeat Oklahoma City—p 425

Intestinal Obstruction F Christopher Evanston Ill—p 431
Experience with Use of Protamine Insulin Preliminary Report B F Keltz Oklahoma City—p 438

Diabetes and Heart Disease E R Musick Oklahoma City—p 441

*Anemia in General Practice H K Speed Jr Sayre—p 443

Anemia in General Practice—Speed says that the most common types of anemia seen by the average practitioner are anemia of pregnancy, anemia associated with sepsis, dental sepsis and endocervicitis, anemia due to dietary deficiencies and anemia of infancy. The treatment of anemia may be divided into three divisions: prevention, the general treatment of anemia and treatment by specific remedies. The field of prevention is rapidly becoming more extensive and is of especial value in anemia of pregnancy and in anemia of infancy, in those due to diet deficiency as well as those due to hemorrhage. General treatment includes bed rest, high caloric and high protein diets, avoidance and removal of the infections, transfusions, and the like. Transfusions are useful in the anemias due to acute hemorrhage and many other conditions in which the cause may not be known, or if there is no specific treatment, such as in carcinoma leukemia and aplastic anemia. They may also be used to great advantage in severe anemia even when specific treatment is used or when response is slow. In the specific treatment of the macrocytic type of anemia, the intrinsic factor as supplied by liver or desiccated hog stomach is of value particularly in pernicious anemia or pernicious anemia of pregnancy, and temporarily so when either the formation of the intrinsic factor in the stomach or its storage in the liver is interfered with as in carcinoma and cirrhosis.

Public Health Reports, Washington, D C

52 1693 1752 (Nov 26) 1937

Immunizing Properties of Formalized Rocky Mountain Spotted Fever Rickettsiae Cultivated in Modified Matland Mediums Ida A Bengtson—p 1696

Methods for Determination of Quartz in Industrial Dusts F H Goldman—p 1702

Study of Dust Control Methods in Asbestos Fabricating Plant R T Page and J J Bloomfield—p 1713

52 1753 1804 (Dec 3) 1937

The Increase in Average Length of Life H F Dorn—p 1753
An Approach to a Rural Mental Health Problem J A Jackson—p 1777

Health Supervision by Nurses in a Biscuity Health Department Brunswick Greenville Health Administration Studies No IV Rosalie I Peterson—p 1783

52 1805 1850 (Dec 10) 1937

Seasonal Variation in Intensity of Brain Reaction of the St Louis Encephalitis in Mice and of Endemic Typhus in Guinea Pigs R D Lillie R E Dyer C Armstrong and J G Pasternack—p 1805

Radiology, Syracuse, N Y

29 651 778 (Dec.) 1937

Development of Postgraduate Teaching in Radiology G W Holmes Boston—p 652

Colloidal Thorium in Localization of Disease Further Experimental Data in Bone Trauma and Infection R Pomeranz Newark N J—p 660

Measurement of Roentgen Ray Dosage by Determining Effect of Radiation on Chromosomes A Marshak and J C Hudson Boston—p 669

Benzidine Sulfate Its Effects on Motor Function of Digestive Tract on Gastric Acidity and on Evacuation of Biliary System Opie Norris Smith and G W Chamberlin Philadelphia—p 676

Effect of Lard Oil Sesame Oil Acacia Retene and 1 2 5 6 Dibenzanthracene on Certain Organs and a Transplantable Rat Sarcoma in Animals of Pure Breed J A Pollia Los Angeles—p 683

*Blood Vessel Markings in Dorsal Vertebrae Simulating Fracture Preliminary Report K S Davis Los Angeles—p 695

The Neck Roentgenologic Study S Brown J E McCarthy and H G Reineke Cincinnati—p 701

Markings in Dorsal Vertebrae Simulating Fracture—Davis describes an anomaly of the dorsal vertebrae which has been at least once interpreted as fracture and as such was the basis of litigation. Roentgenograms showed definite transverse linear marks through the centers of the bodies of the ninth and tenth dorsal vertebrae, best seen in the lateral view but also demonstrable in the anteroposterior view. These lines apparently divided the body into two symmetrical halves, and in one of the roentgenograms the upper half of the body of the tenth dorsal apparently lay about 3 mm anterior to the lower half. There was also a fracture through the anterior superior margin of the twelfth dorsal vertebra with a moderate compression of the anterior margin of the body as a result. A careful review of the lateral roentgenograms of the dorsal vertebrae in the author's files showed forty-three cases in which this anomaly existed. Since then, in viewing lateral films in this region, Davis has observed this transverse linear mark in about 10 per cent of all cases. It was seen in approximately the same percentage of nontraumatic cases as in those in which trauma had been sustained. Lateral roentgenograms of the removed spines of cadavers showed an astonishingly high percentage of transverse linear marks in the dorsal vertebrae (approximately 22 per cent). The vertebrae showing these marks were then carefully dissected out and the blood vessels were injected with a mixture of barium and water. After injecting the blood vessels and taking anteroposterior, lateral and longitudinal roentgenograms, Davis sectioned the vertebrae, some transversely, some anteroposteriorly and some longitudinally. These experiments revealed that the transverse linear marks were due to blood vessel channels in almost all instances. The injected channels were always found to enter the vertebral body in about the center of the posterior vertebral body wall, extending anteriorly into the body for varying distances. In no instance was the author able to trace the channel through the anterior surface of the vertebral body, although in some of the vertebrae the channel extended completely across the body. Nor was he able to demonstrate blood vessels or blood vessel channels entering the body directly on the anterior surface except for an occasional small anomalous vessel.

and they cite a case illustrating this. A comparatively mild angina was followed by a septicemia with signs of meningitis. The patient died and the cerebrospinal fluid was found to be purulent and to contain encapsulated bacilli. Although meningitis as a complication of sinusitis is rare, the authors report a case in which a fistula remained after the surgical treatment of a chronic frontal sinusitis. A meningitis developed and the patient died. The bacteriologic examination revealed the same bacillus in the pus of the frontal sinus in the cerebrospinal fluid and in the blood. The bacillus had the characteristics of Friedländer's pneumonia bacillus. The authors discuss the clinical aspects of pneumobacillary meningitis. They say that in exceptional cases the onset may be sudden, a veritable ictus, but that at times it is slow. The meningeal signs vary greatly in their intensity. Cutaneous hyperesthesia and disturbances in the sphincters are comparatively frequent. On the other hand, the ocular, motor and vasomotor disturbances and the signs of cortical irritation are comparatively inconstant. Hemorrhagic manifestations are exceptional. The fever is often moderate. The blood culture is nearly always positive. Regarding the prognosis of meningitis with the pneumobacillus, they say that it is grave. When the meningitis follows an infection in the ear or nose, a fatal outcome is the rule. Against the septicemic state chemical therapeutics in the form of colloidal metals or of the salts of acridine can be used. The authors resorted to ventriculospinal lavage with lukewarm physiologic solution of sodium chloride, to which several drops of methylene blue in a 1:100 solution had been added. This form of lavage was well tolerated in the case under consideration and effected a slight improvement. However, a second lavage was without therapeutic effect, the patient died.

Policlinico, Rome

44 613 664 (Dec. 15) 1937 Surgical Section

*Goldberg and Takata-Ara Reactions in Surgical Tuberculosis G. Agosta—p. 613

Lambliasis and Appendicitis S. Bachi and C. Scartozzi—p. 622

Importance of Some Factors in Pathogenesis of Experimental Peptic Ulcer IV Chapter on Circulatory Hormone L. Imperati—p. 632

*Preoperative and Postoperative Hydremia V. Jura—p. 646

Goldberg and Takata-Ara Reactions in Surgical Tuberculosis—Agosta performed these reactions in thirty-seven patients who were suffering from tuberculosis and in twelve normal persons for control. The reactions give positive results in 51 and 89 per cent, respectively, in surgical tuberculosis. The reactions, especially Goldberg's, are specific, of diagnostic value and extremely sensitive. Positive results confirm as a rule the clinical diagnosis of the disease showing tuberculosis in evolution. They have to be interpreted, however, in association with the results of roentgen and clinical examinations of the patients. They clarify the diagnosis in doubtful cases and may show a tuberculous etiology for several diseases that are not considered tuberculous. It is advisable to resort to the reactions, especially to the deviation of the complement, for an early diagnosis and treatment of the disease.

Preoperative and Postoperative Hydremia—Jura studied the variations of hydremia in thirty-five patients suffering from abdominal or other diseases and who had been operated on. The highest figures of hydremia before operation were those of patients who had lithiasis of the biliary tract or duodenal ulcer. The group included cases of gastric resection in duodenal ulcer or gastric cancer and those in which operations for biliary calculi, hernia and laparocoele and exophthalmic goiter had been performed, and also appendectomy and explorative laparotomy. Immediately after resection of the stomach in duodenal ulcer, chloremia diminished and hydremia increased. Chloremia and hydremia followed the opposite behavior after operations other than gastric resection. During the first few days which followed the operations, hydremia progressively diminished, especially in those cases in which it was high before the operation. As diet and the daily amount of water ingested by the patients returned to normal, hydremia returned to preoperative figures. The quickest return of hydremia to preoperative figures took place in patients who had been operated on for hernia. Hydremia returned to normal more quickly after appendectomy than after cholecystectomy, notwithstanding the fact that the patients in either case take about the same amount of water for the first few days after the operation.

Hydremia frequently increases during the first two days which follow gastric resection owing to the action of rectoclysis or phleboclysis. The drinking of water after the second day of the operation does not prevent the lowering of hydremia, which takes place during that time up to the fifth or sixth day, when it again becomes normal. Hydremia and chloremia are closely related. They follow parallel oscillations after surgical interventions on the abdomen, except in the case of gastric resection in duodenal ulcer. The variations of hydremia depend on operative trauma and the postoperative diet. They may be modified by the administration of sodium chloride or dextrose isotonic solutions through preternatural routes. The changes of hydremia depend also on the nature of the organ (stomach or liver) on which the operation is performed.

Riforma Medica, Naples

53 1653 1688 (Nov. 20) 1937

Crisis of Old Age G. Monasterio—p. 1655

*Bordet Wassermann Reaction in Blood Serum Freed of Globulin Fraction Precipitated by Hydrochloric Acid M. Acquaviva Coppola—p. 1660

*Anisocytosis of Leukocytes L. Cona—p. 1665

Bordet-Wassermann Reaction in Serum—Acquaviva Coppola used the Wassermann reaction in about 100 serums, which had been previously deprived of the fraction that is precipitated by hydrochloric acid (Auguste's technic). The technic is the one ordinarily used except for the supplemental preliminary work in eliminating the precipitable fraction of the blood serum. The reaction is more sensitive than the Wassermann reaction (twelve per hundred cases). The specificity is the same for the two reactions. The test is indicated in following the behavior of the blood serum during and after administration of antisyphilitic treatment in cases in which sensitivity is one of the aims. The reaction is not a substitute for the common Wassermann reaction, as the technic is more complicated and delayed than the original one.

Anisocytosis of Leukocytes—Cona points out the conflicting statements which exist in the literature as to the presence of dwarf and giant forms of polymorphonuclear neutrophils in the blood of patients who have pernicious anemia, septicemia, puerperal infection without blood complications, all the diseases in which there are hyperleukocytosis or leukopenia, myeloid leukemia and postinfectious leukocytosis. According to the author the size of the leukocytes is normal in the mentioned diseases. The presence of macro-anisocytosis and micro-anisocytosis is due to technical errors. The author's statement is based on the study of the blood of patients suffering from those diseases. He made microscopic blood preparations in the following gradations: extremely thin, thin, ordinary, thick, very thick and exceedingly thick. Corresponding to the gradations, he obtained polymorphonuclear neutrophils of 14.94, 13.28, 11.62, 9.96, 8.30, 6.64 and 4.98 microns. Owing to the fact that anisocytosis, when it exists, depends on technical errors, it has neither diagnostic nor prognostic significance as is stated in the literature.

Prensa Medica Argentina, Buenos Aires

24 2325 2372 (Dec. 8) 1937

Actual Value of Forceps A. Peralta Ramos—p. 2325

*Closure of Cavitation in Course of Hypotensive Artificial Pneumothorax Especially in Reexpansion of the Lung F. A. Medici—p. 2332

Ultrashort Waves in Treatment of Gynopathies M. A. Freire—p. 2338

Cancer of Breast in Man A. A. Emanuel—p. 2356

Hormone Reactions D. B. Avila—p. 2360

Lactogenic Factors R. Caso and E. Colombo—p. 2363

Closure of Tuberculous Cavities—Medici made an x-ray study of the evolution of tuberculous cavitation in four cases of pulmonary tuberculosis, following the confirmation of a hypotensive artificial pneumothorax. He concludes that tuberculous cavitation may remain open in the course of a hypotensive artificial pneumothorax and close suddenly without any apparent cause or in the course of pleurisy or involuntary reexpansion of the lung. The cavity may close during pneumothorax which has been recently established in the mentioned conditions. The closure of the cavity is due to obstruction of the draining bronchus and disappearance of pericavitary atelectasis and it is permanent. When the pneumothorax is selective and the atelectasis is obstructive, the atelectatic lobe remains retracted during reexpansion of the lung. The normal lobe

increases in volume and occupies the place that was left by the atelectatic lobe. The mediastinum deviates to the side of the tuberculous lung on disappearance of the cavity. Later the alveoli of the lobe whose bronchi remained opened expand in order to compensate the vacuum, and the mediastinum may return to its normal position. When artificial pneumothorax has been maintained for some time and has induced pericavitary atelectasis but not closure of the cavity, it is advisable to resort to the maneuver for inducing reexpansion of the lung.

Strahlentherapie, Berlin

60 381 540 (Nov 10) 1937 Partial Index

*Further Experiences with Radium Chloride Injections W Altschul p 381

Influence of Radium and of Benzene on Blood and Blood Forming Organs with Especial Consideration of Leukocytes A Feller—p 393

Practical Results of Reserved Use of Surgical Therapy in Myomas and Preinvasive Metropathias C J Gauss—p 401

Behavior of Small Pulmonary Cavities in Case of Treatment with Light Baths A C Hissink—p 427

*Question of Atypical Cutaneous Reaction After Roentgen Irradiation A Kautzky—p 439

Late Injuries by Roentgen Rays C Kruchen—p 466

*Prognosis of Roentgen Therapy of Pulmonary Actinomycosis B Kuhlmann—p 476

Experiences with Radium Chloride Injections—Altschul says that he first reported on the effects of injections of radium chloride in 1932 and that since then he has made further experimental studies. The result of all these experiments induced him to adhere to his original technic. He usually administers two series of six injections. In the first three of each series of six he injects 1 cc and in the following three 2 cc. Since mild reactions are likely to result at the site of injection, particularly after the injection of 2 cc, the different injections should not be made too close together. A toxic action as the result of cumulation of small doses of radium does not develop with the author's technic. He says that he often treats several joints simultaneously, giving up to three injections at one session. He employs the injections alone or in combination with radium treatment. He obtains especially favorable results in beginning cases of arthritis in the knee and shoulder joints. Cases of rheumatism and neuralgia are likewise benefited by this treatment, as are also arteriosclerotic disorders, such as intermittent claudication, however, in the latter cases the author prefers weak irradiations by means of radium baths combined with irradiation of a segment of the spinal cord or the sympathetic. After giving brief histories of three cases he concludes that, on the basis of his favorable experiences the injection of radium chloride can be recommended. He thinks that the reason it has not found the place it deserves in the therapeutic armamentarium is that it is not sufficiently known.

Influence of Radium and Benzene on Blood Forming Organs—The surprising similarity of the impairment of the blood forming system in persons who work with benzene or related substances and in those who come in contact with radioactive substances induced Feller to make experimental studies on rats on the toxic action of these two substances. He found that radium and benzene produce in rats changes in the total number of leukocytes and in the number of the different forms of leukocytes. The changes in the peripheral blood and in the microscopic structure of the organ were similar in the rats that were irradiated and in those that were treated with benzene. However, regeneration was much earlier after treatment with benzene than after treatment with radium. Small differences such as eosinophilia, beginning reduction in the absolute number of the neutrophils, and small fluctuations in the erythrocytes and in the percentage of hemoglobin in the blood of rats treated with benzene seem to indicate that the mode of action is slightly different in the two types of impairment. It has not been determined as yet whether benzene and radium influence the leukocytes directly or by way of the blood forming organs, for the terminal paralysis of the lymphogenic tissues and of the leukopoietic organs could be a primary condition but could also be elicited secondarily by the leukotoxins.

Atypical Cutaneous Reactions After Roentgen Irradiation—Kautzky reports several cases of atypical reactions after roentgen treatment. In the first case an existing acne, which was slight and had escaped observation, was activated by the roentgen treatment. To be sure, the symptoms of acne were not severe and did not lead to serious sequels. The author

further directs attention to the increased reactivity of the skin in hyperthyroidism. He reports the history of a woman with hyperthyroidism who developed a severe urticaria in the course of the roentgen treatment although the applied doses were rather small. The exanthem was comparatively slight on the extremities and on the trunk, but on the irradiated fields it was severe, there was a sharp demarcation of the fields. In another patient, who had been subjected to irradiations of the spleen, pigmentation resulted which was still visible three months later. In a case of malignant struma, which was subjected to fractionated roentgen therapy, the infection of a scratch in the irradiated area resulted in the suppuration of the entire field of irradiation (10 by 10 cm). A permanent impairment was feared, but two weeks later the entire area had undergone epithelization and the x-ray reaction was subsiding. The author points out that, although these skin reactions usually take a harmless course, they nevertheless introduce a new factor of uncertainty in the already difficult estimation of the biologic reaction.

Prognosis of Roentgen Therapy of Pulmonary Actinomycosis—Kuhlmann says that the literature reports more failures than successes of the roentgen therapy of pulmonary actinomycosis. He thinks that the failures are chiefly due to the fact that the process is not recognized until it has reached a rather advanced stage. One of the causes of the late diagnosis is that the roentgenologic aspects differ widely. Another factor in the failure of the irradiation of actinomycosis is the dosage. Failure seems to be most frequent in case of intensive irradiation whereas roentgen treatment with relatively small doses, in combination with potassium iodide, seems to promise favorable results, provided these measures are employed early. The author reports the clinical history of a patient who passed through a severe pulmonary actinomycosis which spread to the hilar and cervical lymph nodes, the pleura and the left posterior spinal roots. There was even a beginning medullary compression. Early roentgen treatment with fractionated and protracted doses in combination with the administration of potassium iodide and gold preparations produced cure, and the patient is still in good health.

Zentralblatt für Gynäkologie, Leipzig

61 2621 2684 (Nov 13) 1937 Partial Index

Diagnosis of Tubal Carcinoma C Harms—p 2628

Significance of Complement Fixation Reaction, Particularly for Diagnosis of Tuberculosis of Female Genitalia H Mittelstrass—p 2632

*Flocculation Number Reaction of Blood Serum According to Takata Dohmoto in Course of Pregnancy Delivery and Puerperium and in Blood Serum of the New Born Y Charamis—p 2638

Epithelial Metaplasias in Endometritis After Abortion V Dubrauszký—p 2643

Flocculation Reaction During Pregnancy—Various methods have been recommended for the determination of the day of ovulation. Charamis gives attention to the method suggested by Takata and Dohmoto, which expresses the colloidal status of the blood in figures. This method shows that diphasic curves can be observed in the sexually mature woman. A few days after menstruation the curve increases to its highest point, thereupon subsiding to an intermenstrual low point, at which it remains for one day. Then it rises again, to reach a second maximum after from two to three days. Following this second maximum, which does not reach the height of the first one, the curve declines again and reaches its lowest point during the menstruation. Takata and Dohmoto give the following explanation for this behavior of the curve. They assume that, the greater the quantity of hormones in the blood the lower is the flocculation number. The curve increases after menstruation, because the ovary is in the beginning stage of maturation of the follicle and no hormone circulates in the blood. As the maturation progresses and the quantity of hormone increases, the curve of the flocculation number subsides and reaches its lowest point at the time of complete maturation, for at this time the quantity of follicular hormone has reached its maximum. Observations indicate that this lowest point corresponds to the day of ovulation. After that, with the onset of the phase of luteinization, the flocculation curve increases once more because the hormone content of the blood decreases at the onset of this phase. As the quantity of hormones increases again the flocculation curve subsides again. The author studied the reaction on thirty-three pregnant women and found that the values are low until the end of pregnancy nears. Even

when preeclamptic phenomena developed, the values were low. However, in a woman with hyperemesis gravidarum, in whom the pregnancy had to be interrupted, the flocculation curve increased and this increase continued after the interruption. The author determined the flocculation number in twenty-five cases during the period of labor pains. In these women the values varied, but the figures were usually above those observed at the end of pregnancy. He examined nineteen puerperal women during the first twenty-four hours and seventeen women between the fifth and eighth days after delivery. In one group of cases the reaction showed low values shortly after delivery and a second examination after several days showed the same low values, in another group the values were high shortly after delivery and also several days later, in a third group the values were at first low and later high and in some the reverse was the case. In twenty-five cases the blood of the umbilical cord was examined for the flocculation number and it was found that the values were always lower than in the maternal blood that had been withdrawn during labor pains. Since fluctuations in the flocculation reaction are supposedly dependent on the quantity of hormones, the author discusses the hormone content during the various stages.

Wiener medizinische Wochenschrift, Vienna

87 1211 1238 (Nov 20) 1937

Internal Therapy of Diseases of the Stomach. K. Glaessner—p 1211
Rare Case of Gallstone Ileus. W. Goldschmidt and D. Luwisch—p 1216

*Pulmonary Diseases and Suppurations of the Accessory Nasal Sinuses. B. Kecht—p 1219

Pulmonary Diseases and Sinusitis—According to Kecht, bronchitis is the most frequent pulmonary complication of suppurations of the nasal sinuses. The two disorders may develop simultaneously, for instance in the course of influenza, and if the sinusal suppuration is not promptly cured the bronchitis may become chronic, the sinusal process preventing recovery. Then there are bronchitides, which are elicited and sustained by sinusal disorders. Chronic suppurations of the maxillary sinus are most often responsible. If these are cured, the bronchitis generally disappears at the same time. The author states further that bronchiectases have been observed by some authors in connection with sinusal suppurations. However, among his own patients with sinus disorder there were none with bronchiectasis, and examination of his patients with bronchiectasis failed to reveal sinusal suppurations. He further reports the history of a patient with hemorrhagic pleuropneumonia and suppurating pansinusitis both of which were cured following a radical operation on the sinuses. Then he reports another case of the concurrence of pneumonia with sinusitis and a case of suppurating pleurisy complicating a sinusitis. The cited cases prove that pulmonary disorders may be the direct result of suppurations of the nasal sinuses. The author emphasizes that, particularly in cases of suppurations of the maxillary sinus with profuse discharge of pus it should be kept in mind that diseases of the deeper air passages are likely to result not only bronchitis but even pulmonary gangrene. On the other hand, in case of persistent catarrhal disorders of the deeper air passages the nasal sinuses should be examined for possible pathologic changes. In pulmonary tuberculosis, examination of the sinuses and prompt treatment of existing disorders are advisable, because the bronchial disorders that develop in the course of suppurations of the sinuses exert an unfavorable influence on the pulmonary tuberculosis.

87 1295 1322 (Dec 11) 1937

Problem of Cyanosis in Congenital Cardiac Defects of Early Childhood. K. Hochsinger—p 1295

Treatment of Gonorrhea in Both Sexes by Oral Administration of Uliron. A Substance Prepared by G. Domagk. G. Scherber and A. Domes—p 1298

Total Thyroidectomy in Chronic Diseases of Heart and Vessels. F. Mandl—p 1300

*Thrombosis and Auto-Agglutination. E. Weiss—p 1303

Thrombosis and Auto-Agglutination—Weiss points out that thromboembolism has been the object of much discussion in recent years. In view of the fact that Neuda claimed to have found a specific therapy for thrombosis, Weiss decided to study Neuda's theory. He was unable to corroborate Neuda's claim that the predisposition for thrombosis is a result of syphilis, carcinoma and apoplexy. In this connection he cites the fact that in regions where syphilis or carcinoma

is frequent thrombosis is a rarity. In taking up the second point of Neuda's theory, namely, that in thrombosis there is regularly a specific immunologic thrombotic reaction the basis of which is the auto-agglutination that is reproducible in vitro, he shows that the so-called auto agglutination of Neuda is a pseudo-agglutination and partly even a panagglutination, both frequent and partly even physiologic manifestations. Clinical and experimental investigations demonstrated that there is no pathogenic connection between thrombosis and auto-agglutination of the blood. The author also investigated Neuda's assertion that liver therapy is helpful in the treatment and in the prophylaxis of thrombosis. He tried liver therapy in the treatment of thromboembolisms of internal and surgical origin but failed to obtain positive results. In testing the prophylactic effects of liver therapy, he likewise obtained negative results.

Geneeskundig Tijdschr. v. Nederl.-Indië, Batavia

77 3009 3064 (Nov 30) 1937

*Convulsion Therapy in Psychoses. P. M. Van Wulfften Palthe—p 3010

*Provision of Prisoners with Vitamin A. A. G. Van Veen, J. C. Lanzing and M. Agoes—p 3024

Amyloid Tumor of the Skin. P. Harahap and S. Mertodidjono—p 3040

Convulsion Therapy in Psychoses—Van Wulfften Palthe discusses the symptomatology of schizophrénia and then the various methods of treatment, particularly the convulsion therapy by means of metrazol, which he himself employed in seventeen patients with schizophrénia. In thirteen cases the treatment was completed, and in eleven of these a radical change was noticeable. The patients could be discharged without symptoms. The two other cases, in which the schizophrénia had been most severe, were changed but not improved, even after twenty injections. In four other cases the treatment is not yet completed, the time of observation is as yet too short to permit an evaluation. The author says that the rapidity with which the symptoms disappear is surprising and that the manner in which the improvement takes place is different from anything that is ordinarily observed in these cases. Nevertheless the treatment still has some unsatisfactory aspects. To be sure, outside of a luxation of the jaw and a fracture of an arm there were no harmful sequels in 124 induced convulsions, but it has not yet been proved that the brain tissue is not impaired by the convulsions. Moreover, the mode of action is still unknown. The author is of the opinion that the convulsion therapy remains a heroic measure.

Provision with Vitamin A—Van Veen and his associates describe studies on the vitamin A content of the blood serum of some native prisoners in Batavia. Despite the fact that these native prisoners take in practically no vitamin A proper with their food, the average vitamin A content of their serum does not differ greatly from that of Europeans and others in Batavia, whose daily food does contain this vitamin in abundant quantities. A chromatographic method enabled the authors to analyze the serum carotinoids qualitatively and quantitatively and to calculate the amount of provitamin A. Their studies revealed that the vitamin A content of the serum of the native prisoners is derived from the A provitamins, which are contained in their food in large quantities.

Ugeskrift for Læger, Copenhagen

99 1249 1276 (Nov 25) 1937

Lupus Erythematosus Provoked by Light Treatment. Two Cases. H. Haxthausen—p 1249

*Finsen Treatment of Lupus Vulgaris of Skin. After Examination of Three Hundred and Ten Patients in Jylland. S. Lomholt—p 1250

Treatment of Sarcoid of Boeck in Mucous Membrane. K. Barmwater—p 1255

Electrocoagulation Treatment of Cavernous Hemangioma. F. Dujardin—p 1257

Finsen Treatment of Lupus Vulgaris of Skin—According to Lomholt's experience centralization of the Finsen treatment of this disease with the direction in the hands of fully trained specialists in the various fields of the treatment is called for. He emphasizes the excellent results attained both curatively and cosmetically under these conditions. He stresses that the chance of successful results is lessened when other forms of treatment have preceded and that cure can hardly be expected in cases in which eruptions have been neglected for from ten to forty years.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL 110, No 7

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CHICAGO, ILLINOIS

FEBRUARY 12, 1938

CLINICAL FEATURES AND TREATMENT OF FUNCTIONAL OR NERVOUS VOMITING

REPORT OF 140 CASES

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Almost every physician is called on to treat patients who may have functional vomiting. If he is aware of the characteristic clinical features these individuals present and the variety of methods which have been reported to be successful in treatment, he will avoid some of the unfortunate procedures to which many such patients have previously been subjected. As a result of a recent review of 140 cases seen at the clinic in which a diagnosis of functional vomiting was made, we have been particularly impressed by the characteristic features which many of these patients present and by the relatively large number who have undergone surgical procedures with the expectation that a lesion would be found and a successful surgical result accomplished. It seems worth while therefore to emphasize some of these clinical features of functional vomiting concerning which there is relatively little to be found in the literature.

Vomiting is a symptom and not a disease, and it occurs in a large variety of conditions. The causes of vomiting have been classified by Hurst¹ as local, reflex, toxic and central and, as he has pointed out, under appropriate circumstances, any variety of such nonhysterical vomiting may be perpetuated and exaggerated by suggestion after its original cause has disappeared. Local causes of vomiting include irritation or diseases of the stomach, and reflex causes are represented by appendicitis, cholecystic disease, pregnancy and seasickness.

Vomiting of toxic origin occurs during acute infections, whereas vomiting of central origin may occur in the course of cerebral disease or as an expression of extreme emotional disturbance or anxiety. If vomiting occurs as a result of one of these abnormalities in the case of an individual who is unstable nervously or neurotic, it is quite possible that it may continue and become a nervous habit. As time passes the original exciting factor may be forgotten or completely overshadowed and the patient may present a neurosis, one somatic expression of which is regurgitation or vomit-

ing. In other words, the mechanism of production of this type of vomiting is similar to that in many other neuroses and this has led to the use of a variety of terms such as "hysterical," "nervous," "functional," "habit" or "psychoneurotic" vomiting. Because of the large variety of underlying or precipitating factors, patients suffering from hysterical vomiting may consult specialists in almost all fields of medicine as well as general practitioners.

CLINICAL AND LABORATORY DATA

We have recently reviewed the clinical data in these 140 cases of functional vomiting and have obtained follow-up reports on the results of treatment in ninety-seven of the cases covering a period of at least two years following examination. Of the 140 patients 112, or 80 per cent, were females, twenty-eight, or 20 per cent, were males, eighty-nine patients, or 64 per cent, were between 20 and 40 years of age. The wide variability in the duration of the vomiting is illustrated in table 1, and it is significant to note the large number of cases in which the vomiting had persisted over a period of five years.

Patients frequently forget the factors which may have been significant in precipitating their symptoms. In this group, abnormal mental or nervous states, indigestion and epigastric distress or postoperative vomiting was given as the principal cause of vomiting (table 2). Many patients said they knew of no reason for their vomiting, the remainder reported a variety of miscellaneous initial causes. One hundred and three patients, or approximately 75 per cent, vomited at least once daily, whereas the remainder experienced periods of remissions of variable duration not infrequently related to operation, medical treatment, vacations, change in environment or certain days of the week. Vomiting usually occurred within one hour after the ingestion of food. The most frequent immediate inciting factors were eating, nervousness, worry, excitement or emotional disturbances. The amount of food vomited was generally small, although not infrequently large amounts, and sometimes apparently even the entire gastric contents, were expelled. In but 27 per cent of the cases was nausea a prominent symptom, and all except two patients were able to reach a receptacle before vomiting.

It is surprising to note how frequently patients with functional vomiting are free of other gastro-intestinal symptoms. In the present series only fifty-one, or 36 per cent, complained of epigastric distress in some form. Approximately the same number suffered from constipation. Other abdominal symptoms associated with the vomiting are given in table 3.

One would anticipate that vomiting as long continued as it was in many of these cases would lead to marked

From the Division of Medicine the Mayo Clinic.
1 Hurst A F. Hysterical Vomiting. New York M J 111 45-49
(Jan 10) 1920

emaciation It is therefore surprising to note the number of cases in which the weight remained unchanged In the present series ninety patients, or 64 per cent, showed evidence of loss of weight, but in only thirty-one cases, or 22 per cent, was the general condition of the patient poor Physical examination revealed some abnormality in the pelvic organs as the most common physical finding outside of loss of weight and it occurred in nineteen cases, or 17 per cent of the female patients There were no other characteristic manifestations, although a hyperesthetic abdominal wall and abdominal tenderness were occasionally observed Neurologic examination was performed in twenty-four cases, in most of which it was negative However, in 104 of the 140 cases there was evidence that the patient was of the "nervous" type and was subject to worry, phobias, emotional upsets, exhaustion or depression, only thirteen patients were regarded as normal Evidence of cardiovascular instability, as manifested principally by tachycardia and blushing, was not uncommon Grand mal, peripheral neuritis, von Recklinghausen's disease, neurosyphilis and mental deficiency were the diagnoses in isolated cases

Observations of the number of erythrocytes and values for hemoglobin, gastric analyses and estimations of the basal metabolic rate gave essentially normal results in those cases in which they were performed Roentgenologic studies of the stomach, gallbladder and colon were made in many cases In 115 cases, or 82 per cent, roentgenologic examination of the stomach and duodenum was negative, in seven cases a gastroenteric anastomosis was reported to be functioning freely, and in three cases a duodenal ulcer was found Fifteen patients were not examined roentgenologically

As has been indicated, it is important to note how frequently surgical treatment is carried out in an attempt to relieve functional vomiting As the clinical symptoms become increasingly recognized in the future, probably many patients will be spared needless surgical procedures In the present series sixty patients, or 43 per cent of the whole group, had been operated on previously because of the vomiting, and a total of eighty-three surgical procedures had been carried out in an effort to relieve symptoms Ten of these sixty patients felt that good results had been obtained from the operation although the vomiting had recurred subse-

Other features which may be quite helpful in diagnosis are the onset of vomiting or its recurrence during periods of nervous stress or strain or as a result of fatigue, the characteristic ability of the patient to reach a receptacle before vomiting, the ease with which vomiting occurs, the frequent lack of associated abdominal symptoms and, not infrequently, the report that the patient is able to return to the table and complete the meal after vomiting The ability or desire to eat again immediately after vomiting is characteristic of many cases of functional vomiting and it is rarely present

TABLE 2—Cause of Onset of Vomiting as Noted by Patients (140 Cases)

Causes	Cases
Nervous or mental states	34
Indigestion or epigastric distress	22
Unknown or no apparent reason	22
Following operation	17
Exhaustion	8
Food or other intoxication	6
Migraine or other severe headaches	5
Pregnancy	5
Trauma to abdomen	2
At onset of menses	2
Too much laxative	1
Following sore throat	1
Infectious or postinfectious states	1
Drugs	1

when vomiting is the result of organic disease If studies of the blood and urine, gastric analysis, and roentgenograms of the gallbladder, stomach and duodenum are essentially normal, if the basal metabolic rate is normal or perhaps slightly low, and if the patient states that the appendix has previously been removed because of the vomiting and that dysmenorrhea or pelvic discomfort is not uncommon, then the classic picture of functional vomiting is presented

In some cases, especially those in which the condition is of rather recent duration and those in which there are lesions in the gastro-intestinal tract or disease in other organs, the diagnosis is more difficult and demands much careful observation, clinical judgment and experience In the differential diagnosis in such cases must be included migraine, pregnancy, food sensitiveness or allergy, and those systemic diseases in which vomiting may be the chief or only symptom Addison's disease, hyperthyroidism with crises, organic diseases of the nervous system (particularly brain tumor with increased intracranial pressure), gastric crises, uremic states, and the like, may be confusing until an adequate history is obtained and examination completed The vomiting associated with abdominal migraine may be quite confusing, particularly if the headache is not marked However, the periodicity of the vomiting and the associated headache, photophobia, irritability, loss of appetite and the not infrequent occurrence of vomiting at the menstrual periods usually enable one to recognize migraine as the cause of such vomiting The patient with migraine rarely cares to eat until the attack is over and vomiting has ceased

It is always wise to be sure of the diagnosis before suggesting it to the patient, and organic lesions should be carefully excluded by an adequate history and careful physical and laboratory examinations Examinations which are negative are of much value in reassuring patients and are therefore useful as a therapeutic measure

METHODS OF TREATMENT

The methods of treating functional vomiting vary widely and include all the known methods of treating neurotic patients In the final analysis, psychotherapy

TABLE 1—Duration of Vomiting (140 Cases)

Time	Cases
Less than three months	19
From three to six months	15
From six to twelve months	17
From one to two years	23
From two to three years	12
From three to four years	10
From four to five years	11
Five years or more	28

quently The operations which had been performed most frequently were appendicectomy, cholecystectomy and cholecystostomy, operations on the stomach and pelvic organs, and exploration of the abdomen

DIAGNOSIS

The diagnosis of functional vomiting is generally not difficult The typical picture is presented by a relatively young woman with signs of nervous, emotional or cardiovascular instability who, without much apparent reason or associated abdominal distress or nausea, has for months or years vomited within an hour after meals without much appreciable effect on her general health

is of tremendous importance in the treatment of these patients. This may vary widely from what Hurst¹ has called "treatment by explanation," which consists of explaining the situation to the patient, informing him that his stomach is perfectly healthy and, after convincing him of these facts, sitting with him while he eats and retains a normal meal, to quite the opposite method of rest in bed, abstinence from food, administration of sedatives, and then gradual rehabilitation of the digestive tract and reeducation of the patient, as suggested by Drenckhahn and Wilbur.² It seems obvious that surgical methods are useless in the treatment of functional vomiting. Temporary improvement may follow an operation but it is probably psychic in origin. As has been said, in the present series sixty patients, or 43 per cent, have been operated on because of vomiting and in all cases the vomiting had recurred or had persisted postoperatively.

The reassurance that goes with the complete confidence of the patient in the ability of his physician to exclude organic diseases and to gain eventual success by treatment is the keystone of all efforts in the treatment of functional vomiting. Many patients require little more than the reassurance that they do not have some organic disease. In other cases such reassurance and a careful explanation of the factors and mechanisms involved in producing the bouts of vomiting by a physician in whom the patient has great confidence are sufficient to overcome the difficulty. Mild sedatives, particularly bromides and barbiturates, given a short time before meals, and a dry diet are extremely useful. The stomachs of many of these patients are apparently better able to handle solid than liquid food, and solid food given without liquid is much more difficult to regurgitate or vomit. Many patients have learned this through experience and they normally limit or exclude fluids at meal time. Adequate rest, mental and physical relaxation, exercise, physical therapy and similar procedures may be of great benefit indirectly in improving the nervous state of the individual with functional vomiting and may aid him in overcoming his symptoms.

In some cases in which vomiting is marked and has led to much loss of weight and malnutrition, or in which

and fluid by mouth. During this period fluids are supplied by proctodysis or subcutaneously or intravenously in the form of solutions of dextrose and salt in sufficient quantities, usually about 1,500 cc daily, to prevent great thirst and acidosis. Sedatives such as amylal or pentobarbital sodium administered rectally or parenterally are of great value during this period, since they reduce the general reactivity of the patient and reduce the

TABLE 4—Results of Treatment (Ninety-Seven Cases*)

	Total	Vomiting Diminished or Recurred Number	Vomiting Continued Number	Vomiting Stopped Number	Per Cent
Males	24	2	5	17	70
Females	73	14	27	32	43
Vomiting daily	68	14	24	30	44
Vomiting periodically	29	2	8	19	65
Vomiting of less than two years duration	42	7	11	24	57
Vomiting of more than two years duration	55	9	21	25	45
Less than five years since treatment	44	10	11	23	52
More than five years since treatment	53	6	21	26	49
Total cases		16	32	49	
Per cent		16.5	33	50	

* Cases in which the patients were followed for a period of two to eight years after examination.

irritability of the vomiting center as well as the activity of the gastro-intestinal tract. In our experience at the clinic from 3 to 4½ grains (0.2 to 0.27 Gm.) of pentobarbital sodium in 1,500 cc of a 5 per cent solution of dextrose by rectum in twenty-four hours has worked very satisfactorily.

After a period of from two to four days on such management the patient usually tires of his predicament and becomes hungry or thirsty. It is beneficial to wait until the patient asks for food or water before supplying it. Small amounts of water (from one-half to 1 ounce) or solid food (toast, cereal, and so on) may then be given at frequent intervals. If the patient retains food, the program of intravenous and rectal administration of fluid and sedatives may be gradually relaxed. If vomiting occurs or the patient suggests that it may recur, he should be reminded that the previous program will be instituted again.

On continuance of this program the patient will soon be eating well of a dry diet, with no fluids until at least an hour after meals. Reward for good behavior and punishment for relapse work splendidly in the management of these patients. The physician must be firm and, if necessary, uncompromising. In some cases in which difficulty is encountered additional aid may be obtained during the period of recovery by the use of (1) insulin to stimulate the appetite, (2) feeding by gastric or duodenal tube, (3) elevation of the basal metabolic rate, if it is low, and (4) occasionally gastric lavage.

RESULTS OF TREATMENT

The results of treatment (table 4) have been compiled for the ninety-seven cases in which the patients were followed from two to eight years after examination at the clinic. The methods of treating these patients varied widely, most of them received ambulatory treatment. These patients were observed during a period of reexamination at the clinic, or we have received information from them in answer to follow-up letters. While there has been much discussion of the question-

TABLE 3—Abdominal Symptoms Associated with Functional Vomiting* (140 Cases)

Symptoms	Cases
Epigastric discomfort (in some form)	51
Constipation	45
Eretrations	19
Left-sided abdominal discomfort	8
Right upper abdominal discomfort	7
Right lower abdominal discomfort	7
Pyrosis	5
Menstrual cramps	2
Diarrhea	1

* More than one symptom present in some cases.

the nervous features are outstanding, hospital treatment may be advisable. The patient should be under the care of one physician and not of several, and he should be separated so far as possible from his usual environment and from overzealous relatives and friends. The background for the development of the vomiting should be ascertained. Complete rest in bed and rest of the stomach is very helpful in reducing the number of stimuli which reach the vomiting center. It is advisable to stop, temporarily but completely, the intake of food

² Drenckhahn C. H. and Wilbur D. L. Treatment of Functional Vomiting. *Am. J. Digest. Dis. & Nutrition* 1: 635-637 (Nov.) 1934.

able value of follow-up letters in determining the condition of patients, it seems quite clear that such letters should be of value in determining whether or not a patient continues to vomit and to what he attributes the cessation of vomiting if it has stopped.

It will be noted in table 4 that in forty-nine of the ninety-seven cases, or 50 per cent, the vomiting stopped completely, in sixteen cases, or 16.5 per cent, the vomiting decreased or subsequently recurred, whereas in thirty-two cases, or 33 per cent, the vomiting failed to stop. Men (70 per cent) stopped vomiting more frequently than did women (43 per cent). Those who vomited periodically were more likely to obtain a good result and stop vomiting than those who vomited steadily (65 per cent of those with periodic vomiting stopped whereas only 44 per cent of those with daily vomiting stopped). The duration of the vomiting was not a particularly important factor so far as the result obtained was concerned. Of those whose vomiting was of less than two years' duration, 57 per cent stopped vomiting, whereas of those whose vomiting was of more than two years' duration, 45 per cent stopped vomiting. Apparently relapse was not more likely to occur after a period of five years than before this time, as indicated by the length of time between the beginning of treatment and our final report. The types of treatment instituted, the age of the patient, the occurrence of associated abdominal symptoms, and other factors were not significant in influencing the results of treatment.

Patients attributed cessation of vomiting to a large variety of factors, including institution of a diet, elimination of offending varieties of food, medical treatment of various types, self reliance, reassurance, rest, cessation of nervousness, and other known or unknown causes.

In those cases in which vomiting recurred, the time elapsing before recurrence was less than six months in eight cases, more than six months in eleven cases, in other words, relapse occurred at any time but usually within two years after treatment.

For a more recently studied group of patients with marked functional vomiting who were treated in the hospital along the lines previously noted, the immediate results have been excellent. In ten cases the vomiting stopped entirely, although in one case it subsequently recurred. Sufficient time has not passed adequately to evaluate the permanent results of treatment in this group.

PROGNOSIS

The immediate prognosis in these cases is usually good. The rapidity with which progress is made and the ultimate prognosis depend almost entirely on the degree and extent of the abnormal mental reactions of the patient. Those who do not display marked psychoneurotic tendencies or whose psychotic changes are not advanced generally do well. The prognosis is better for men than for women. The duration of vomiting before treatment is initiated is not a significant prognostic factor, to some extent, however, the more frequent the vomiting the less hopeful the outlook for a permanent result.

SUMMARY

A review of 140 cases of functional vomiting reveals that in most cases there are characteristic clinical and diagnostic features. Continued vomiting which is usually without effort, nausea or significant abdominal symptoms and which occurs within an hour after meals is typically functional. Most patients are women between the ages of 20 and 40 years, and while they are

relatively healthy in appearance they present evidence of instability of the nervous system. There is a large variety of inciting factors, including nervousness, fatigue and ingestion of food with or without transient indigestion. In sixty, or 43 per cent of the cases in this series, operation and particularly appendicectomy, had been performed for the vomiting without benefit to the patient.

Many types of treatment have been tried, some of which have proved successful and some of which have failed. The keystone of treatment is psychotherapy. Fifty per cent of the ninety-seven patients who were followed for a period of from two to eight years after examination had complete relief from vomiting.

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OPERATIVE AND CONSERVATIVE TREATMENT OF TUBERCULOSIS OF THE SPINE

A COMPARATIVE STUDY

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Twelve years ago a physician came to one of us for advice about his 10 year old son. This boy was suffering from tuberculosis of the spine. The father, an unusually intelligent man, had consulted eight or ten of the most prominent orthopedic surgeons in New York City and Boston. The conflicting advice which he had received bewildered him. Although the majority of the surgeons consulted advised a fusion operation, there were some strong advocates of conservative treatment. Neither the conservative opinions nor those involving operation were, to his way of thinking, backed up by convincing arguments. He asked specifically "Does the operation shorten the course of the disease and prevent deformity?" As we tried to answer this question we realized that from our own past experience we could not give an affirmative answer with any degree of assurance. We found that we had accepted the experiences of Albee and Hibbs without a critical test of the operative method as compared with the conservative.

Shortly thereafter the country home of the Hospital for Joint Diseases was opened for the treatment of tuberculosis of the bones and joints. We decided to make a ten year test to determine the relative effectiveness of the two modes of treatment. Our plan was as follows. Patients admitted to the home were to be divided as impartially as possible into two groups, each of which was to be given exactly the same dietetic and general hygienic treatment, but in one group fusion operations were to be done and in the other conservative measures alone were to be followed. The test was to apply to all patients with bone or joint tuberculosis, but this report deals only with tuberculosis of the spine. Our study has been limited strictly to children up to the age of 20. Tuberculosis in the adult differs radically from the disease in children, and the two

should not be confused. We have thus far not had a large enough series of adults with Pott's disease to reach a valid opinion regarding the two methods of therapy. The idea of this experiment is not new or original. In 1927 Kidner and Muro reported a similar test on a smaller series of patients, and surely many other surgeons must have had the same idea. If they have, however, they have not published their results, for we have searched the literature in vain for reports of an exhaustive research similar to the one which we have performed.

It must be obvious that with a disease like tuberculosis no conclusions can be reached from a brief period of study. The disease is essentially a chronic one, there is a tendency to recurrence and it is only by extending the trial period over a considerable number of years that the truth can be ascertained. Even a ten year period may be misleading, and it is possible that after another ten years has elapsed we may be compelled to change the conclusions that we have reached as a result of the first ten years of study. One fact is assured. This study was undertaken in a spirit of earnest seeking after truth. No one on the staff had an axe to grind. Despite our great personal admiration for both Hibbs and Albee, the protagonists of the fusion operation, despite the excellent theoretical basis for the operation, which on a priori grounds has led many fair-minded orthopedic surgeons to endorse it, we studied the problem without any prejudice either for or against one method or the other.

The number of cases of spinal tuberculosis has not been large. Tuberculosis of the bones and joints is getting to be an infrequent disease in our community. This is no doubt due to the more efficient inspection of the milk supply and the effective educational campaign

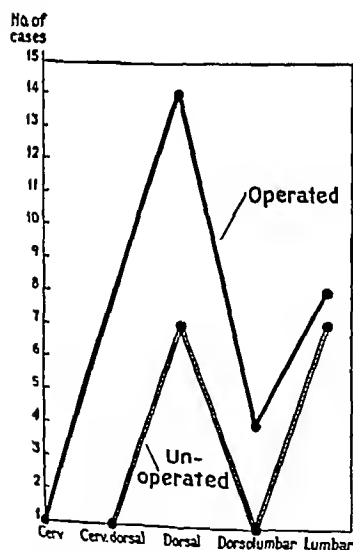


Chart 1—The parallelism between patients operated on and those not operated on with respect to the site of the lesion

In all, forty-three cases are being reported. Twenty-six patients were treated by fusion procedures and seventeen by purely conservative measures. In assigning the patients to the two groups, an attempt was made so far as was humanly possible to make the series parallel. Chart 1 shows the distribution of the cases with regard to the region of the spine affected, and one can note the close parallelism between the series operated on and the series not operated on. With

regard to the age of the patient, a similar parallelism is seen in chart 2. It was of course impossible to decide the virulence of the infection with any degree of certainty, but we tried to pair off the severe infections and those of the lesser grade.

In only one respect was this parallelism not carried through consistently, namely, in the case of patients who were extremely ill. Operation was then considered to be contraindicated. Another contraindication was a sinus discharging near the diseased spinal area.

In dealing with a chronic disease such as tuberculosis, it is obvious that considerable difficulty arises over the question "When is the patient cured?" This difficulty, it seems to us, may be the explanation for some of the discrepancies in the literature.

To say that a child is cured of tuberculosis because he is temporarily free from pain and muscle spasm is in our opinion quite incorrect. The criteria for cure which we have laid down are the following:

- 1 Pain, fever, muscle spasm and tilt of the body must completely disappear for at least three months. During this observation period, patients were kept at the country home, where they could be watched daily. The necessity for this precaution was emphasized in a high percentage of cases, since many of the patients who, when in bed, had shown no symptoms promptly acquired them when allowed to walk about.

- 2 Abscesses must disappear both clinically and roentgenographically and sinuses must close.

- 3 In the roentgenogram there must be evidence of increased calcification in the area of destruction, cessation of all advance of the process and a so-called bloc formation. A persistence of mild hyperactivity of the reflexes we did not consider inconsistent with the cure, since in some instances there was every other sign of cessation of activity during a lengthy observation period. The hyperactivity of the reflexes we considered due to permanent, slight changes in the cord which could not be expected to disappear.

The correctness of our judgment in deciding when a patient was cured is confirmed by the fact that, of all our patients, only one of those operated on had to be readmitted for a relapse and only two of those not operated on.

What then are the comparative results of this study?

First, does the operation abbreviate the course of the disease, does it stop the pathologic process? This question can, we think, be answered by the average number of days of care required before the patient could be considered cured. For those not operated on, 876 days was the average duration of treatment, for those operated on, 1,215 days (chart 4). In other words, the patients operated on, although matched impartially against those not operated on, required approximately 40 per cent more time for their cure. This fact is so striking, so much at variance with the

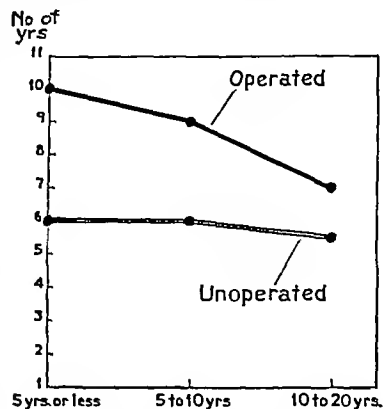


Chart 2—The ages of the patients operated on and of those not operated on. Note that the two lines are approximately parallel.

claims made for the operation, that it took many years before we could believe it ourselves. The figures have been checked and rechecked, and the statistical record is supported by our own impression as we studied the patients from week to week.

Under the conditions of our experiments, we were compelled by this simple study of the number of days' care to reach the conclusion that the fusion operation does not shorten the duration of the disease but that, on the contrary, it prolongs its course.

When we reviewed the figures on mortality there seemed to be a contradiction. Only two patients operated on died, five not operated on died. This would at first sight seem to indicate the superiority of the operative procedure. When we analyzed the cause of death, however, we reached a different conclusion. One death after operation was due to an infection which gradually progressed and resulted in meningitis. There was also one case of miliary tuberculosis. The five patients not operated on who died were all extremely ill at the time of admission, and for this reason operation was contraindicated. Reports of these cases follow.

CASE 1—George T, aged 4, was admitted Sept. 6, 1927, with lesions of the tarsal bones as well as of the dorsal spine. His general condition was very poor and he was suspected of having pulmonary tuberculosis. Active signs in the lungs were discovered, and in 1929 he was transferred to Bellevue Hospital, where he died.

CASE 2—Harold F, aged 15, was admitted Sept. 21, 1927, with an active lesion in the lumbar part of the spine and a lesion in the shoulder. His general condition was considered too poor to permit of operation. He became incontinent because of involvement of the bladder and died in August 1929, presumably of ascending infection of the kidneys.

CASE 3—Vincent C, aged 7, admitted Nov. 27, 1925, had a dorsolumbar lesion, with multiple sinuses which made the execution of an operation impossible. The patient's decline was gradual. He was treated for 1,446 days, thus decidedly raising the average number of days' care for the patients not operated on. He finally died, Nov. 10, 1929.

CASE 4—Juanita T, aged 7, admitted March 7, 1924, was in poor general condition. Within a month she had become incontinent, and she died of tuberculous meningitis May 24, 1925.

CASE 5—Doris E, aged 4, admitted March 5, 1922, had a lesion of the dorsal spine and later of the lumbar part of the spine, with multiple abscess formations and enteritis. At no time was her condition sufficiently good to warrant an operative procedure. She was treated 1,432 days. Death from meningitis, occurred Dec. 7, 1927.

It is, we believe, only fair to conclude that these patients would have died irrespective of the type of treatment employed.

It must not be felt that because we did not consider these patients suitable for operation we regard the operation as a grave surgical procedure. Both the Albee and the Hibbs operation can be performed in less than an hour, and the degree of surgical shock is as a rule slight. No deaths could be attributed directly to the operation except the one due to infection. Regarding technic, the majority of the operations were done by the Albee method, three by the Hibbs method and one by the Kleimberg beef bone graft. That the operation produced a solid fusion of the spine in all but three instances could be demonstrated clinically, by x-ray examination and by observations in certain secondary operations, in which, irrespective of the technic, the spines were found firmly fused. In the three cases in which a pseudarthrosis in the fused area could be demonstrated, refusions were successfully done. The striking thing is that, despite this fact, the pathologic process in the vertebrae themselves was apparently uninfluenced by the operation.

Does the operation check the formation of abscess? Comparing the two groups, we found that in five of the patients operated on abscesses or sinuses developed after the fusion procedure, in other words, in about 20 per cent of the cases. Abscesses developed in three, or about 18 per cent, of the patients not operated on. In other words, they developed with about the same degree of frequency in the two groups.

Does operation prevent paraplegia? By paraplegia we mean symptoms referable to the cord evidenced by ankle clonus, marked hyperactivity of the quadriceps reflex and the Babinski phenomenon. In four patients operated on these signs occurred after successful fusion. In the patients not operated on there were also four cases. The percentage was therefore slightly larger for the patients not operated on. In answer to the question "Does the operation prevent paraplegia from developing?" it is obvious from our experience that it does not. Two of the cases in which operation was performed are particularly deserving of mention in this respect.

CASE 6—J. F., two years after discharge, despite excellent fusion as shown both by x-ray examination and clinically, had to be readmitted because of spastic gait and marked hyperactivity of the reflexes. After a prolonged period of recumbency he recovered.

CASE 7—Z. B. was readmitted three years after discharge for the same reason as J. F. In her case an exploratory laminectomy was done. To expose the spine a massive wall of bone fully one half inch thick had to be removed from the entire area of the fusion. There certainly was no doubt that the operation had resulted in a solid fusion and yet despite the fact that the patient had been discharged from the home without any symptoms, the process in the vertebrae had continued and had caused sufficient abscess formation to produce flattening of the cord with consequent paraplegia.

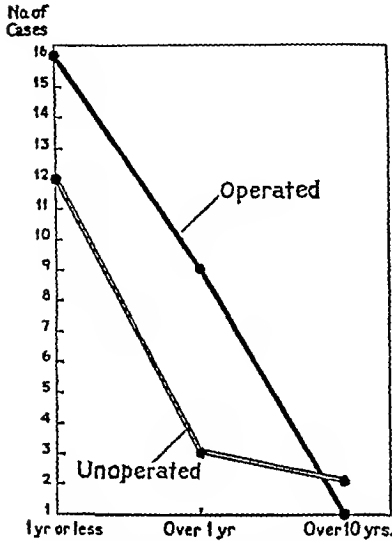


Chart 3—The duration of the disease before admission in the two groups of cases. Except in a small number of cases of over ten years' duration the two groups are closely parallel.

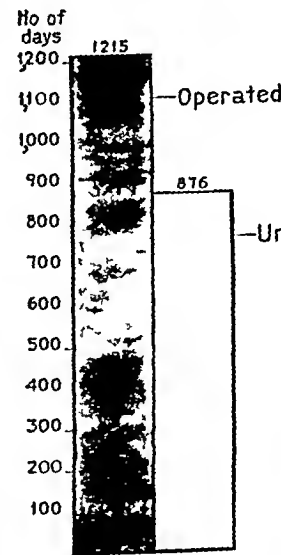


Chart 4—The number of days' care of the patients operated on and of those not operated on. For the former the average was 1215 days of hospital care and for the latter 876 days.

These two cases also answer the question "Can recurrences take place after a successful fusion procedure?" It is obvious that they can. One patient not operated on also had a recurrence. This patient is still in the home and is the only inmate of the institution included in the present study.

Does operation prevent progression of deformity? To answer this question, careful records were kept by tracings of the spine and by comparison of roentgenograms. No particular difference could be observed between the patients not operated on and those operated on. The progression seemed to occur despite fusion. In cases of the milder forms of infection, particularly in the lumbar part of the spine, the progression of deformity could be checked or, in some cases, completely cured by postural treatment with or without operation. In the cases of more virulent infection, chiefly of the mid-dorsal region, deformity progressed despite everything that we could do. It was equally marked in the patients operated on and in those not operated on.

When we were studying our statistics it occurred to us that the duration of activity of the disease before the operation was performed might be a significant factor. The following figures are noteworthy. In twelve cases in which the duration of the disease was six months or less before the patient's admission, the average number of postoperative days of care was 990. In seven cases in which the disease had been active from one to two years, the postoperative period of care averaged 1,210 days. In three cases in which the duration had been respectively four, six and thirteen years, the average was only 480 days. From these figures it is evident that in the three cases in which activity had been present for a long period, four years or more, the operation had a beneficial effect, making it possible to discharge the patient as cured in a much shorter period than would otherwise have been possible. This observation accords with the opinion of Calve, who waits until the disease process shows signs of subsidence before he inserts a bone graft. There is also an obvious difference between the group that was operated on during the first year of the disease and the group in which the disease was active from one to two years. Healing occurred more rapidly in the patients in whom the activity had been present a shorter period. It may be that, could spinal tuberculosis be diagnosed during its incipient stage and a fusion done at once, the course of the disease would be altered. Unfortunately, we have no clinical material available to answer this question. It is one of the problems we leave to the future.

CONCLUSION

As a result of ten years of observation of tuberculosis of the spine we are impressed not only by the ineffectiveness of the fusion operation but by our ineffectiveness as physicians. An average of 876 days of care for patients not operated on is a high figure. True, it conforms to the experience of honest, careful observers here and abroad, but it shows how little physicians have been able to do to hasten the process of healing.

In our efforts to improve our patients we have given them complete rest, either on frames or on plaster shells, the best of food and all the sunlight and fresh air that our climate permits. In addition we made a three year trial of tuberculin therapy, unfortunately with a negative result. The same lack of success has

attended the use of fresh spleen, liver meal and splenic extract, the injection of sinuses with irradiated petrolatum and the injection of abscesses with sodium morrhuate. We are compelled to admit that tuberculosis of the spine is a chronic disease which runs its course little influenced by the efforts of the orthopedic surgeon. Frank realization of this fact should not cause discouragement but should act as an incentive to the study of more effective methods of combating tuberculosis of the spine.

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ABSTRACT OF DISCUSSION

DR BENJAMIN P FARRELL, New York. The authors deal exclusively with the result as judged by the time required to become symptom free, this is not the result of the case. There are no data as to how long the patients remained well or how long they were observed. My experience is that tuberculosis tends to recur in unfused spines. The standard so called cures allow cases treated conservatively to be classed as cures. A higher standard can be set. After fusion many patients become well, with complete ankylosis in the affected area and with a completely healthy appearance in this ankylosis. Such cases are really cures, there are no recurrences. This cure is frequently attained after fusion, practically never on conservative treatment. The authors minimize the higher death rate of the patients treated conservatively on the ground that they were so ill they would probably have died regardless of the method of treatment. It must not be overlooked that they became seriously ill on conservative treatment before they were seen by the authors. If they had had fusions early they would not have become seriously ill. Patients still active in the hospital are not included in judging results. They should be, they are not well yet. There are nine patients still active on conservative treatment not included in the figures from which the duration of treatment was derived. On the other hand, it is not stated how much of the time attributed to operative treatment was used up in conservative treatment before operation.

DR F C KIDNER, Detroit. The authors cited the article that I published in 1927, which was dependent on the observation of fourteen cases, in seven of which treatment was done by the conservative method and in seven by the so-called Hibbs fusion. As long after-treatment was required in the seven surgical cases as in the seven treated conservatively, but the disease was apparently healed. Since that time there have been two recurrences in the surgical cases and none in those treated conservatively.

DR ARTHUR STEINDLER, Iowa City. The confusion is due to the fact that the premises are not stated clearly. First, is the fusion operation the universal operation? Certain premises, certain conditions, have been set up which I at least find it convenient to respect, particularly the fact that the disintegrative stage of the tuberculosis shall have passed and that the patient shall show unmistakable signs of repair. There are other premises or restrictions, such as the youth of the patient and the location or the site of the tuberculosis. If we continue to disregard our premises we will do injustice to both the conservative and the operative treatment, because if I respect such limitations of the operation as I have stated I find that the fusion operation becomes more and more valuable the more it is restricted to its proper place. One sees abscesses develop and sinuses reopen and spines breaking down after the operation. One sees paralysis develop, not after the fusion but during the healing of the fusion, while the patient is still bedfast. Is this attributed to the fusion? No. The fusion is exonerated, it is the tuberculous process that is responsible for it. On the other hand, the fusion is not responsible for the disappearance of the paralysis or for the disappearance of the abscess, since it is merely a mechanical means. As the authors have stated, the cure of tuberculosis is a matter of the general reaction of the organism and I can only repeat that I shall continue to use the fusion operation, but I shall continue to be just as rigid and even more so in defining its proper field of application.

DR A. BRUCE GILL, Philadelphia I have formed opinions as to the matter under discussion as a result of almost thirty years' experience with the conservative methods of treatment and twenty-five years with the operative methods. Tuberculosis in adults does not show the same tendency to heal under conservative treatment as does tuberculosis in children. Early operation is therefore usually indicated. I have learned by experience not to operate on children under 10 to 12 years of age unless there is some particular reason for doing so, such as an inability to carry out adequate conservative treatment. The reasons are these: 1. During the acute stage of tuberculosis the child is ill. It is below par. Any operation would still further lower its resistance to disease. 2. The tuberculous lesion is active and progressive. Operation does not necessarily stay its progress. It can continue to develop in spite of operation. Fusion of the spine by the Albee or the Hibbs method is only a means of securing rest to the diseased area. This, of course, is only a factor in the cure of tuberculosis. Complete bodily rest and proper feeding and hygienic measures are just as essential. 3. The fused portion of the spine is soft, flexible bone which will bend and permit increase in the deformity. Therefore a child that has been operated on must be treated for a long time just as if no operation had been done, and the operation, if done during the acute progressive stage of the disease, may have injured the child. The only claim that can be made for the early operation is that if and when the child recovers its spine is fused. But it is surely wiser to defer the operation until the later date when bodily resistance has increased and has overcome the disease. Nature's forces must turn the tide toward health. No operation should be considered until fever has long subsided, until the child has put on weight, until the anemia has disappeared, until cold abscesses have ceased to develop or have disappeared. I believe with Dr. Steindler that one should draw rigidly and with due reasons the line of demarcation between operative and nonoperative treatment of tuberculosis of the spine.

DR LEO MAYER, New York This study was undertaken in a spirit of absolute fairmindedness. We are just as anxious to know how to treat cases of tuberculosis of the spine effectively as Dr. Farrell is, and we would earnestly suggest that at the New York Orthopedic Hospital, where they have such an excellent follow-up system, for the next ten years they try an experiment similar to ours. I believe that they will find that their cases which have not been treated operatively but which have been treated effectively and conscientiously by nonoperative methods will show no more tendency to recur than those in which the fusion operation has been done. That, at any rate, has been our experience in our ten year trial. Dr. Farrell raised the question of the standard of cure. These cases have been followed for the ten year period. No case is reported here that has not been under observation for a minimum of four years after discharge from the home. The two series were run absolutely parallel, there were a few more cases in the surgical group than in the group in which operation was not performed, because I must admit that at first we were rather in favor of fusing when we were in any doubt. Dr. Farrell also commented on the fact that the mortality of five cases in the group in which operation was not performed seemed to indicate that there was something wrong with that method. Those children were not operated on because at the time of their admission they were so sick that we felt it was a definite risk to the life of the patient. They had not been treated effectively up to that time. Their bad condition must not be considered a slur on either the operative or the non-operative method. They were poor tenement house children, frequently a diagnosis had not been made for a year or two after the onset of the disease. These children would have come to fatal termination irrespective of the method of treatment. The length of time before the operation was done is a most important subject. We felt in the operative group that it was wise to defer the operation until the child was in fairly good condition. If at the time of admission the child was in good condition the operation was done at once, but we have comparatively few cases in which the disease had been present

for less than a year. Most of the children had had the disease for a year, and it is possible that were the diagnosis of tuberculosis made at a very early stage of the disease and a fusion procedure done at that time, there might have been a beneficial effect in arresting the course of the disease. That is a subject which demands further investigation.

THE CONTROL OF MENINGOCOCCIC MENINGITIS EPIDEMICS

BY ACTIVE IMMUNIZATION WITH MENINGOCOCCUS
SOLUBLE TOXIN FURTHER STUDIES

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In July 1936 the senior author¹ reported observations on the control of epidemics of meningococcic meningitis by active immunization with the soluble toxin in the filtrate from meningococcus broth culture. The full strength filtrate was given subcutaneously in 0.2, 0.5, 1 and 1.5 cc amounts at four day intervals as early as possible in five outbreaks.

The fact that no further cases occurred in epidemics in which it had been given and that intradermal reactions changed from positive before inoculation toward negative after inoculation² caused us, during the past year, to give the toxin a prophylactic trial among the CCC enrollees in the state of Missouri and to use it for the purpose of control in as many incipient epidemics as possible. The results of this work are here described.

THE VALUE OF INTRADERMAL TESTING AND PROPHYLACTIC IMMUNIZATION

To determine the value of the intradermal test for separating susceptible persons from nonsusceptible persons and the value of immunizing young adults with soluble toxin to prevent the development of the disease in those found susceptible, intradermal tests were made on 7,339 enrollees in forty-eight camps, averaging 152 men each, in the state of Missouri.

Method of Procedure—The method of testing was simply to have one of us test the members of all of the different camps to insure uniformity. The time consumed by this procedure was approximately six weeks. The skin test dose consisted of 0.1 cc of a 1:200 dilution of the toxin, given intracutaneously on the forearm. A control test was done on each subject, 0.1 cc of a 1:200 dilution of heated filtrate being used.

After the tests, persons showing a 1 plus or greater reaction received 0.5, 1, 1.5 and 1.5 cc of full strength toxin subcutaneously at four day intervals. The toxin

From the Seventh Corps Area Research Board, the Station Hospital and the Seventh Corps Area CCC Laboratory.
Surgeon General Charles R. Reynolds, Col. Kent Nelson, Col. D. W. Harmon and Lt. Col. John R. Hall afforded us the opportunity to give this filtrate a clinical trial in this area. Major Charles B. Sprunt gave counsel and advice with reference to the bacteriology and Miss Mae McDowell, BA, assisted us in recording the data and preparing the manuscript.

¹ Kuhn's D. M. The Control of Meningococcic Meningitis Epidemics by Active Immunization with Meningococcus Soluble Toxin. A Preliminary Report. J. A. M. A. 107:511 (July 4) 1936.
² Ferry, N. S. and Steele, A. H. Active Immunization with Meningococcus Toxin. J. A. M. A. 104:983-984 (March 23) 1935.

was standardized by requiring 1 cc of a full strength filtrate to hemolyze 1 cc of a 1 per cent saline suspension of rabbit red blood cells. This procedure will be described in a subsequent publication.³

Control for Intradermal Testing—The enrollees were retested by the same doctor two months later. Our control for the use of the same strength of toxin on the second test was as follows:

1 A group of nine unimmunized persons in the laboratory who produced an average of a 1 plus reaction were retested at the end of two months to determine the amount of deterioration of the toxin. This procedure was completed, and practically no deterioration was found, as shown in table 1. (Toxin should not be diluted until just before using.)

2 Members of the camp who gave a plus-minus or negative reaction and had not been immunized were tested along with those who had been immunized as a further control of the constancy of the testing solution and the toxin used.

Dilutions of Toxin Used for Intradermal Testing—By previous experiment we had found that testing with a 1:200 dilution of the toxin, standardized as before, produced a 1 plus or greater reaction in approximately 50 per cent of the persons tested. For that reason, those of the group tested showing a 1 plus or greater reaction should be the 50 per cent most susceptible, and by immunizing this group we hoped to prevent the appearance of meningitis in the camps.

Results of Intradermal Testing and Immunization in Missouri—As shown in table 2, in the fall of 1936, 7,339 was the total number of enrollees tested. Of this number 3,926, or 53.5 per cent, had a positive reaction to the dilution of toxin used, 3,773 of this group were inoculated with the full strength toxin as described.

Approximately two months later, 3,517 of the original positive reactors were retested, and it was found that the reaction of 742 remained positive, that is, there was a 78.1 per cent change from positive to negative. Our controls, the group with a negative or a plus-minus

The three cases that occurred among the negative and plus-minus reactors are considered significant because they indicate that even though we found 53 per cent who had a plus or greater reaction we had not selected all the susceptible persons. We then increased the strength of the testing dilution to 1:20 and found that all but 1 per cent gave a 1 plus or greater reaction.

Since a 1:200 dilution of toxin was used for testing and 53 per cent gave a 1 plus or greater reaction and three cases developed in the plus-minus reactors, and the next serial dilution of toxin, 1:20, was then used.

TABLE 2—Results in 7,339 Young Adults of Intradermal Testing and Prophylactic Immunization with Meningococcus Soluble Toxin

	Number	Per Cent
1 Men tested	7 339	
2 Men showing 1 plus or greater reaction	3 926	53.5
3 Men immunized with 0.5, 1, 1.5 and 1.5 cc of full strength filtrate at four day intervals	3 773	96.1
4 Results of testing two months after immunization		
(a) Original positive reactors tested	3 517	
(b) One plus or greater reaction	742	21.1
(c) Plus minus reaction	1 612	45.8
(d) Negative reactions	1 163	33.0

and all but 1 per cent were found to have a positive reaction, one is led to suspect that practically every one is susceptible to meningococcal meningitis provided the dose and the virulence of the meningococci are sufficiently great. Therefore, in the presence of an epidemic or as a prophylactic measure among people who have not been exposed to submorbid doses of meningococci, the logical immunizing procedure would be to immunize all persons concerned regardless of their reaction to the intradermal test.

After the completion of the second intradermal test, after the two month interval, all of the remaining plus-minus and negative reactors were immunized, so that at the present time all enrollees of the Missouri CCC district are immunized, as well as all the newly enrolled personnel.

Number of Cases Before and After Prophylactic Immunization—Twenty-six cases of meningitis occurred in the same number of CCC camps in Missouri in the two years prior to the initiation of our prophylactic immunization. None have occurred up to the present time in members inoculated with the soluble toxin.

RESULTS OF THE USE OF MENINGOCOCCUS TOXIN IN EPIDEMICS AND BEGINNING OUTBREAKS

Conditions Under Which Toxin Was Used—Since we first used the meningococcus soluble toxin in an outbreak of meningitis in August 1935,¹ we have had occasion to collaborate and use this toxin (which we produced for experimental use and clinical trial only) in twenty different groups in which one or more cases had actually occurred.

This obviously we consider the best means of determining the value of the toxin in protecting exposed persons and controlling epidemics of meningitis. The greater number of these outbreaks were in CCC camps, in the young adult age group, averaging 20 years. However, one beginning outbreak occurred in an older age group in the Leavenworth Penitentiary, the average age being 37.

Use of the Toxin in Explosive and Chronic Types of Epidemics—In addition to the outbreaks that occurred in junior CCC camps, two of the most serious

TABLE 1—Comparison of Reactions of the Same Persons After a Two Month Interval to Control Toxin for Deterioration

Name	Oct 26 1936		Jan 12 1937	
	Test	Control	Test	Control
Mortensen	++	—	++	—
Stohl	+	—	+	—
Perry	++	—	++	—
Blythe	++	—	++	—
Pilger	++	—	++	—
Godfrey	++	—	++	—
Ford	++	—	++	—
Kiener	+	—	+	—
McDowell	—	—	—	—

reaction who were tested and not immunized, showed a tendency to shift slightly to the positive, thus indicating that there was possibly a greater amount of immunity given than indicated by the tests.

The Use of the Intradermal Test—One month after testing had been completed, three cases of meningitis developed in three different CCC camps among the 1,612 plus-minus and negative reactors who had not been immunized. In the camps in which the cases occurred, the remainder of the enrollees who gave plus-minus and negative reactions were immunized, with no further occurrence of cases in the camps.

³ Kuhns D. M., and others. Hemolysis of Rabbit Red Blood Cells by Meningococcus Soluble Toxin to be published.

occurred in institutions where younger boys were housed. In the Boys' Training School in Oklahoma, twelve cases had occurred during the past year. In the Kansas City Boys' Orphanage, five cases occurred in an explosive outbreak in nine days. This illustrates the use of the toxin in both an explosive and a chronic type of outbreak. In incipient epidemics there is no indication of the type of epidemic into which they will develop. Therefore it is important that every control measure available be used as early as possible after the appearance of the first case.

TABLE 3—Results of the Use of Meningococcus Toxin in Twenty Epidemics and Beginning Outbreaks

Location	Date	No of Cases Before Inoculation	No Tested	No of Tests 1 Plus or Greater	No Inoculated	Percent Positive After Inoculation	No of Cases
Co 1742 Tarkio Mo	April 1936	9	187	14	165	100.0	0
Co 4702 Burlington, Kan	Dec 1935	2	207	89	80	80.0	0
Co 4734 Forrest City Ark	March 1936	3	219	64	119	88.8	0
Fort Riley Kan	May 1936	2	199	20	20	Not completed	0
Co 1710 Van Buren Mo	June 1936	1	157	34	73	Not completed	0
Co 2772 Watford City N D	June 1936	1	161	87	83	Not completed	0
Federal Prison Leavenworth Kan	July 1936	1	467	118	105	80.0	0
Boys' Training School Okla	Sept 1936	12	315	176	172	98.3	1
Camp Gunlock Utah †	Nov 1936	3	187	26	37	100.0	0
Boys' Orphanage Kansas City Mo	Nov 1936	5	122	104	111	94.0	0
Co 1734 Bethany Mo	Dec 1936	1	155	79	149	87.4	0
Co 2814 Purcell Okla	Dec 1936	4	176	147	175	45.8	0
Co 3785 Butler Mo §	Jan 1937	1					0
Co 2728 Sullivan Mo	Jan 1937	1	159	117	126	85.9	0
Co 3732 Palmyra, Mo	Jan 1937	1	148	111	123	60.3	0
Co 1743 Cadet Mo	Jan 1937	1	169	89	83	82.5	0
Camp Lodge Custer, S D	Feb 1937	5	160	87	160	Not completed	0
Camp Doran Custer S D	Feb 1937	1	191	118	191	Not completed	0
Custer S D	Feb 1937	2	200		200	Not completed	0
Co 2877 Monrovia Calif	Feb 1937	5	161	66	131	90.7	0

Protective doses of toxin were given in the month indicated immediately after the last case occurred in all camps.

* Percentage of persons whose original skin test was positive and whose second test, after two months, was plus minus or negative.

† Number of cases that developed in close contacts after immunization was completed.

‡ One case of meningitis developed in a person showing a negative skin test who did not receive the inoculations.

§ The entire company was immunized without testing.

A most serious situation presented itself in the occurrence of a case of meningitis in the federal prison at Leavenworth, Kan. Here, where the inmates were concentrated in a very small area, ample opportunity was present for the rapid spread of an epidemic. This case occurred in June 1936 following an extended period of extreme hot weather, bringing attention to the fact that the danger of meningitis is not confined entirely to the colder seasons.

The most explosive and virulent of the outbreaks was the one at Camp Lodge, S. D., where there were four cases and four deaths in ten days. This outbreak followed closely an epidemic of influenza which had mani-

festated itself in some form in practically every enrollee of the camp. It was significant that the first cases occurred in recently enrolled adults.

Group Immunity Low—As in most of the other epidemics, no connecting line of contact could be established between the patients, in that they lived in different barracks, were not seated next to each other in the mess hall and were not in the same work groups. A survey of Camp Lodge showed that a high percentage had residual disease of the upper respiratory tract, indicating that the general immunity of the group was low. After inoculation of the entire group, no further cases occurred.

Analysis of Twenty Meningitis Outbreaks—In table 3 we have simply recorded the outbreaks in which we used the toxin for active immunization, after either the first case or the first group of cases. It has been our policy to inoculate with the toxin as early in the epidemic as possible. The names of the places where it has been used have been included to show the locations of these outbreaks.

The approximate dates have been given to indicate the time of year in which the epidemics occurred; they occurred most often in the fall, winter and spring. As can be seen in the table, in nine of the outbreaks only one case had occurred before inoculation, in the remainder the number varied from two to twelve.

In the beginning the groups were tested in order to differentiate the susceptible from the nonsusceptible members, a positive reaction being used as a criterion. Only those having a positive reaction were immunized. However, after our experience in prophylactic immunization in Missouri, where cases occurred in persons having questionable reactions (plus-minus), it was decided to inoculate the entire group to afford protection to those who were not so sensitive to the test.

Here it might be well to state that the variation between the plus-minus and the 1 plus reaction is so small that it would not be safe to attempt to differentiate when the development of a virulent epidemic may be possible.

Table 3 also shows the difference in the results of the intradermal tests under various conditions. The factors that vary are the syringes, the alcohol on the skin, the merthiolate in the testing solution, the lighting conditions and the judgment of the physician giving the test. All these factors may cause a difference in the results of intradermal testing. The table, however, shows in a majority of instances that there was a shift from positive to negative, which is of experimental value in indicating the amount of immunity present after inoculation with the toxin.

Of greatest significance are the results tabulated in the last column of table 3, i. e., the occurrence of no further cases after inoculation with the toxin, with the exception of one case, which occurred in the Boys' Training School in Oklahoma.

COMMENT

For the purpose of accumulating further experimental data, we recommend the use of the intradermal test whenever it can be done under controlled conditions. For the purpose of controlling epidemics, we recommend that the skin test be not used, that all persons in the group be inoculated, to afford whatever immunity may be obtained during the period of greatest danger and that reinoculation be done when it is necessary to place persons in unusually crowded quarters.

and during periods of danger of further outbreaks. This applies especially to the younger age groups.

To establish the best possible active immunity against epidemic meningitis, a greater antibody-producing substance is needed. However, until such a product is available, it is suggested that further trial of the filtrate is warranted.

SUMMARY

1 Value of Intradermal Skin Testing and Prophylactic Immunization—Of 7,339 junior CCC enrollees in forty-eight different camps in Missouri, tested intradermally, 3,926, or 53.5 per cent, showed a 1 plus or greater reaction, 3,517 of the original positive reactors were retested after an interval of approximately two months, and the reaction of 78.9 per cent had changed from positive to plus-minus or negative.

All enrollees with a 1 plus or greater reaction were inoculated with 0.5, 1, 1.5 and 1.5 cc of full strength filtrate at four day intervals. The greatest reactions were caused by the third dose. This dose produced mild systemic reactions, with temperatures occasionally at 101 or 102 F. No untoward reactions occurred.

One month after immunization, three enrollees with plus minus reactions, who were not immunized, in three different camps, had meningococcic meningitis. After immunization of the remainder of the group, no further cases occurred.

Twenty-six cases of meningitis have occurred in CCC camps in Missouri in the past two years. None have occurred in those immunized persons in the same groups in the seven winter months since inoculation.

2 Results of the Use of Toxin in Twenty Epidemics and Beginning Outbreaks—In some of the first outbreaks only persons with a 1 plus or greater reaction were immunized. Later all persons were immunized regardless of the reaction to the intradermal test.

Prior to giving the toxin there were nine outbreaks of one case each. In the remainder of the outbreaks the number of cases varied from two to twelve. Only one case has occurred in the period of from one month to one and one-half years since the immunizations were completed in the twenty camps.

In immunizing newly concentrated groups or groups in the presence of impending epidemics, we believe that the safest procedure is not to depend on the intradermal test to differentiate the immune from the nonimmune but to inoculate the entire group.

Further trial of the full strength meningococcus filtrate as an active immunizing agent against epidemics of meningitis is warranted.

Something Wrong with Man Himself—When are we to realize that a great proportion of mankind continues to be as stupid, unteachable, bloodthirsty, predatory, and savage as we are wont to imagine that maligned and regrettably extinct precursor—Neanderthal man? Is it because the precepts of Christianity have not been sufficiently disseminated, or because the blessings of plumbing and mechanical transport have been too narrowly restricted, or because there are still a few persons who lack the degree of Bachelor of Arts? I think it is because no little of the human germ plasma is poisonous slime and we have not had the intelligence and the courage to attempt to find out anything about human heredity. We have imagined universal education, mutual understanding and improvement of the social environment to be the ingredients with which we can concoct the human millennium, we have mixed them up and stirred them in and turned out a horrible mess. There must be something the matter with our basic element—man himself.—Hooton E. A. Apes, Men, and Morons. New York, G. P. Putnam's Sons, 1937, page 269.

A THREE-STAGE OPERATION FOR THE REPAIR OF HYPOSPADIAS

REPORT OF CASES

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AND

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Plastic surgery of the penis and urethra in common with all phases of plastic operative work has made great strides in the past decade. A patient requiring operation has generally been regarded as particularly fortunate if cured at all, and in not a few such cases as many as a dozen operations have been necessary to secure the desired result. We have recently developed a three-stage operation for the repair of hypospadias which we consider sufficiently successful to warrant this report.

TYPES OF HYPOSPADIAS

Hypospadias is a congenital malformation of the anterior urethra, the canal terminating at some point on the underside of the penis. It occurs in both males and females, but this communication is concerned only with the male. There are three types, or degrees of hypospadias: (1) the balanic, in which the urethral opening is in the glans but somewhat below its normal location at the summit, (2) the penile, in which the opening may be anywhere between the glans and the penoscrotal junction, and (3) the perineal, in which the opening is in the perineum or in a cleft in the scrotum. As hypospadias is not uncommon and is frequently associated with other anomalies of the urogenital tract, variations from any of these types are likely to be encountered.

In the balanic type of hypospadias the urethral opening is in the position normally occupied by the frenum. Occasionally there are two or even more orifices. An open groove runs along the normal position of the urethra from the anomalous orifice to the point where the normal urethra should open. The glans is much shorter than normal and usually imperforate, though it may be pierced by an opening which is separated from the urethra by a blind sac. The prepuce is short and thick at the dorsum of the penis but becomes thinner as it approaches the urethral meatus. In the fully developed adult the penis will be more or less deflected downward at the point at which the hypospadias begins.

In the penile form the meatus is found at any point on the under side of the penis between the glans and the penoscrotal junction. The opening will be oval instead of the transverse slit usually observed in the balanic type. The urethral canal rarely extends beyond the point of opening, a deep groove on the under surface marking its normal route. Occasionally there will be a perfect canal anterior to the anomalous opening but the meatus at the tip of the glans will be imperforate or much strictured. When the anomalous opening is at the penoscrotal junction, the penis is usually much shorter than normal and incurved on the scrotum, to which it may be partly adherent. Sometimes the scrotum will be beneath the urethra and completely cleft. The corpora cavernosa likewise may be separated.

Read before the Section on Urology at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 9, 1937.

The perineal form of hypospadias is the most difficult to remedy. Fortunately it is also the rarest. Associated malformation of the external genitals is marked. The anomalous meatus is usually situated about 3 or 4 cm. from the anus, being a slitlike opening in the groove which divides the scrotum into two

generally so far from the glans as to bring it outside the vagina during intercourse, thereby preventing impregnation—a peculiarly distressing form of impotence.

SURGICAL CORRECTION OF HYPOSPADIAS

From early times the efforts of surgeons have been enlisted for the correction of this unfortunate condition. The various types of operation used to correct hypospadias may be classified as (1) simple canalization, (2) denudation and suture, (3) the use of penile or preputial flaps, (4) the use of scrotal or abdominal flaps, (5) a combination of the preceding methods, (6) mobilization and dislocation of the urethra, and (7) transplantation of tubes of skin or mucous membrane, veins, arteries, appendix, ureter or urethra.

The first operations were plastic in type. Chief among the earlier procedures for formation of an anterior urethra was that of Diffenbach, which consisted in piercing the glans back to the normal urethra and keeping this new passage patent by means of a cannula until an epithelial lining had formed, the anomalous opening being closed. Duplay subsequently used a flap from the prepuce to cover the defect and form a new urethra. Thiersch's method utilized double rectangular flaps of penile skin, the base of one being near the urethral groove, the other on the opposite side of the penis. One flap was used to form the

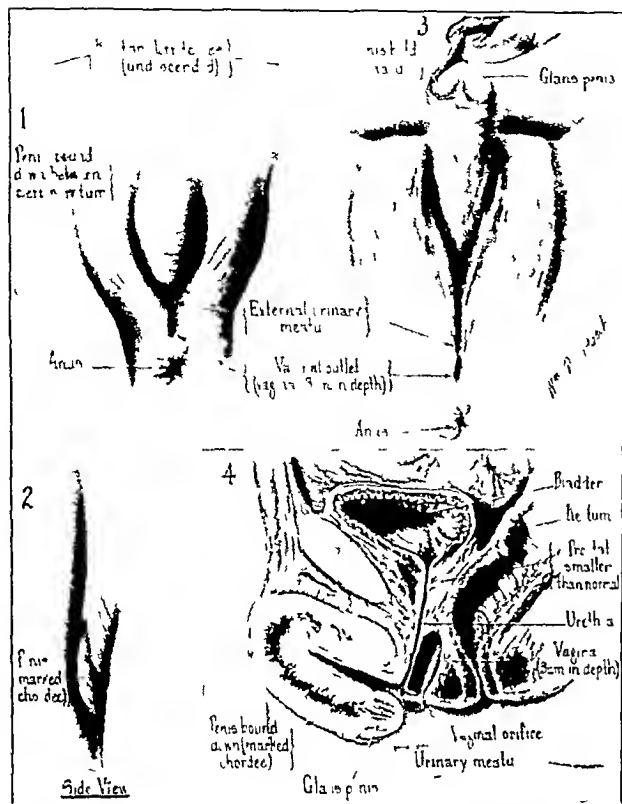


Fig. 1—(1) Undescended testes marked chordee with penis between cleft scrotum. Perineal opening of hypospadiac urinary meatus. Vaginal pouch 3 cm. in depth with opening in perineum just posterior to urinary meatus. (2) Side view showing marked chordee. (3) Penis held up showing urinary meatus orifice of vagina with their relation to anal outlet. (4) Sagittal section showing relation of vagina to urethra.

parts. Labium-like folds of mucocutaneous tissue lie on each side of this orifice, giving it somewhat the appearance of a small vagina. Each half of the cleft scrotum may contain a testicle, which is often atrophied or, as frequently happens, the scrotum may be undeveloped and the testicles retained within the abdomen. As a rule the urethra continues as a groove for some distance beyond the anomalous opening on the floor of the shortened and incurved penis and may end as a blind sac at any point along its normal course, but the tip of the glans is always imperforate.

As the membranous and prostatic portions of the urethra do not share in the deformity, the urinary stream is projected with normal force which obliges the unfortunate victim of perineal hypospadias to sit down to urinate. In the milder forms although the penis is abnormally angled it may usually be held in such a way as to direct the stream so that the clothing at least will not be wet, but the victim of perineal hypospadias is likely to carry about him an objectionable odor of stale urine and may become more or less of a social outcast on this account. An additional misfortune is that intromission in the perineal type, is entirely prohibited and sexual congress practically impossible. In the penile form the urethral opening is

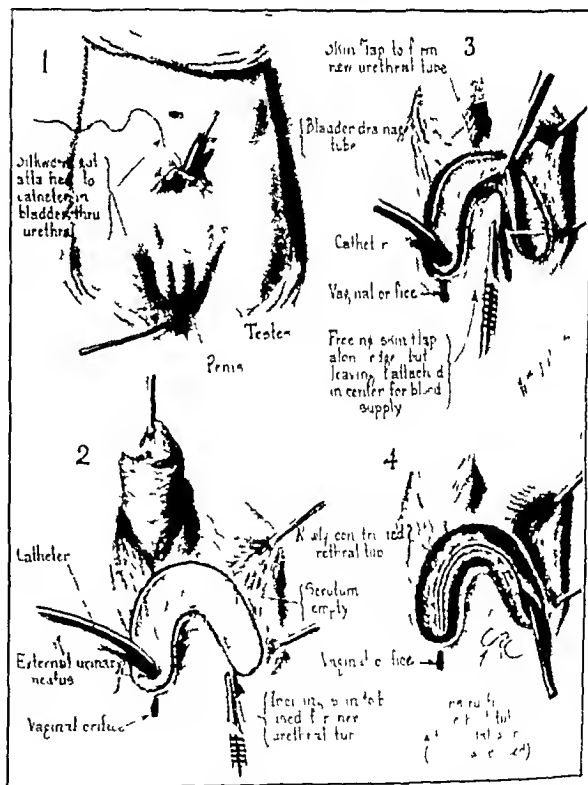


Fig. 2—(1) Suprapubic drainage. Silkworm gut attached to catheter in bladder through urinary meatus. Silkworm gut to be used to facilitate postoperative instrumentation. (2) Outlining skin flap to be used to construct urethral tube. Incisions are carried outward on empty scrotal sac. (3) Freeing skin flap along edges leaving it attached in center for blood supply. (4) Forming urethral tube with scrotal skin around a catheter. Silver wire used.

urethra the other to cover over the canal. All these procedures were for one reason or another objectionable.

In 1897 Carl Beck of New York introduced a method of dislocation of the urethra which was extensively

practiced Transplantation of tubes of various sorts has been tried, as follows In 1897 Nove-Josserand utilized tubes of skin, in 1904 Pringle tried the urethra, in 1909 the ureter was utilized by Schmieden, blood vessels were tried by Contris in 1911 and the appendix by Anhausen in 1918 Rosenstein applied

isolated by undercutting each edge slightly, and a tube is constructed by approximating the edges over a catheter, without tension and using silver wire loosely applied The edges of the remaining scrotal tissue are then sutured together, so that at the end of this first stage there is an attached tube of scrotal integument—the new urethra—buried in the scrotum This tube is left in place for a sufficient length of time to permit firm healing As the end of the tube tends to constrict, a piece of tension suture is threaded into the tube and fixed in position, being attached to the suprapubic incision and the meatus of the new urethra where it remains until the final stage of the operation

STEP 2—After complete healing has ensued the second stage is undertaken The scarred gutter of the distal portion of the anomalous urethra is dissected away, the deformed penis is relieved of the scar tissue which causes a congenital chordee, and the glans is split into two parts Incision is then made in the scrotal skin covering the new urethra and the penis is sutured to it The cut edges of the penile wound are sutured to the two edges of the scrotal wound, and the glans penis is carefully affixed to the urethra in such a manner that the end of the tube extends for an inch beyond the end of the penis This excess is required so that any increase in the length of the penis during

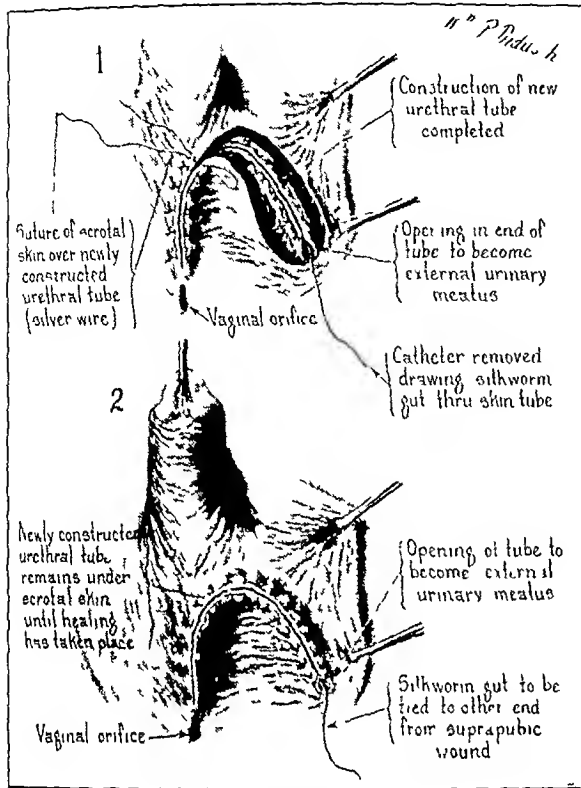


Fig 3—(1) Urethral tube constructed. Drawing skin over tube. Silver wire used. Tube to remain in scrotum until healing has taken place. (2) Repair completed. Silkworm gut drawn through tube by removing catheter

tubes of mucous membrane in 1929 and later, in 1931, used a portion of the wall of the bladder

THREE-STAGE OPERATION OF THE AUTHORS

STEP 1—The first stage consists of diversion of the urinary stream by means of a suprapubic cystostomy and formation of a tube from scrotal integument

Probably the most important single step in multiple stage operations for the repair of penile and urethral anomalies is the operative diversion of the urinary stream. It is our practice to do this by suprapubic cystostomy, during which a double suction tube (Kenyon) is sutured into place. The inner tube is connected with suitable suction apparatus and the patient is thus kept with an empty bladder, and no urine passes over the operative site. Some surgeons prefer drainage by means of a perineal wound. It has been our experience that this type of drainage is not so successful, as there is a tendency for urine to pass along the tube into the urethra and thence to the operative site, often causing necrosis and breaking down even the most beautifully repaired urethra.

Having diverted the urinary stream the next step is to construct a new urethra, which we do from scrotal integument. An inch-wide strip of scrotal skin extending from the anomalous opening laterally and either downward or upward as far as necessary to secure a piece about an inch longer than the penis, is partially

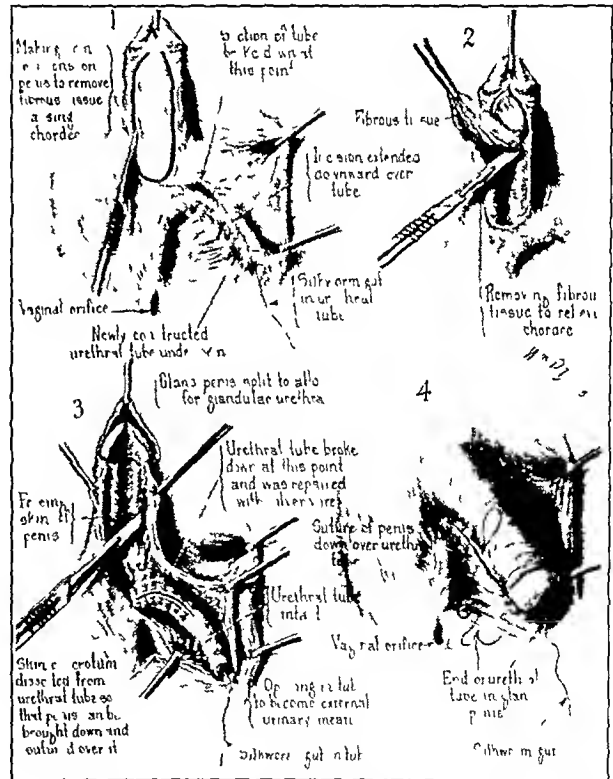


Fig 4—(1) Making skin incision to remove fibrous tissue causing chordee. (2) Removing fibrous tissue en masse. (3) Freeing skin of penis to allow penis to be sutured down over urethral tube in scrotum. (4) Suture of penis down over urethral tube. Silkworm gut left in urethral tube

erection will be accommodated by the urethra, which in the quiescent state of the penis is too long

STEP 3—In the third stage the urethra is freed from its bed. After remaining in position for a suffi-

cient length of time for the new tube to become firmly fixed to the penis (usually from ten to fourteen days) the entire structure is dissected free from the scrotal bed with ample scrotal tissue to cover the freed urethra without pressure. The raw edges of both the penis

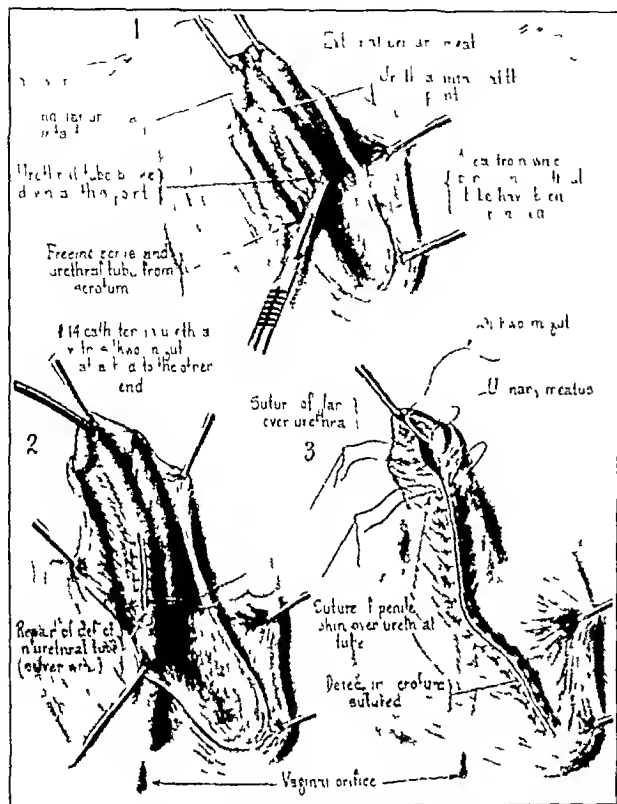


Fig. 5—(1) Freeing penis with urethral tube from scrotum. A break down occurred in the urethral tube. (2) Penis has been freed. Shows repair of the defect in the tube. Silver wire used. (3) Suture of glans penis over urethral tube. Suture of penile skin over urethra and closure of skin of scrotal defect.

and the scrotum are repaired. After healing occurs the operation is completed by allowing the suprapubic wound to heal.

The suprapubic fistula usually heals promptly, and the skin is kept dry by the oval suction apparatus recently described by us.¹

REPORT OF CASE

A most interesting case, in which repair was successfully done by this method is described in detail.

R. P. was born in 1918. Though the infant was somewhat small and under weight the attending physician proclaimed it to be a normal healthy baby and in a few weeks it was christened Mary Florence. Toward the end of the first year the child's mother noticed what seemed to her an abnormality of the external genitals but was assured by the local physician that the condition was merely a slight enlargement of the clitoris and of no serious import. However as the child grew the enlargement became more pronounced so that at 4½ years following medical advice little Mary was brought to the hospital for amputation of all or as much of the hypertrophy as should be deemed advisable but the surgeon after careful examination decided against operation and nothing was done.

When first seen by one of us (C. L. B.) when the child was 5 years of age the following history was elicited. During the past year the parents had noticed that the feminine traits such as playing with dolls which had been so prominent in the

earlier years, seemed to be changing with a leaning toward the more masculine pastimes, such as baseball tree climbing and mechanical objects.

On examination at this time the child appeared healthy was of normal size, and had a markedly intelligent face. The pelvis, thighs and chest were masculine in outline. The external genitals however were distinctly feminine in appearance, the labia majora being well formed and prominent. Between the labia was a protuberance about 1 inch in length and three-fourths inch in circumference in the location and having the appearance of an enlarged clitoris. In the line below and partly covered by it, was located the normal sized urinary meatus and below this again the vagina, having an opening the size of a goose quill through which a probe could be inserted for an inch. Careful rectal examination revealed no trace of uterus, tubes or ovaries. A testicle was palpable in either groin each as big as a large lima bean flattened antero-posteriorly, oval and freely movable. Here was a state of affairs requiring much thought in order to advise the parents conscientiously a baby registered as a girl on its birth certificate, reared as a girl in a small town until the age of 5 years, but in whom there was such marked predominance of the male characteristics as to make almost certain a brass voice beard and general masculinity in adult life. It was felt that with absence of female adnexa and the presence of normal, though undescended, male gonads it would be feasible at a later date by plastic surgery, to form a new penile urethra close the blind vaginal sac and anchor the testicles in a scrotum formed from the labia majora. With this in view, it was advised that there should be the necessary change of name, clothing and the like which was effected more conveniently by the parents taking residence in another city.

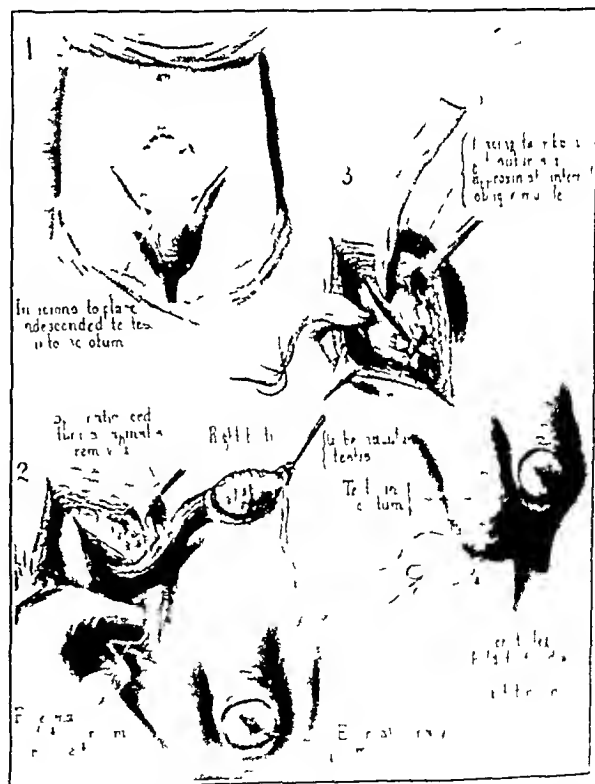


Fig. 6—(1) Bilateral incisions to place undescended testes in scrotum. (2) Funnel vaginalis removed, cord and testes freed. A suture has been placed on gubernaculum testis to hold testis in scrotum on tension. A finger is used to make a pocket in scrotum for testis. (3) Testis in scrotum. Placing suture in leg to hold testis on light tension. Weir is being closed and the internal oblique muscle is being approximated with ribbon gut.

Robert attended school having a good record in his studies as well as in football baseball and other masculine sports.

When next examined at the age of 12 years he presented the appearance of a well developed boy with manly voice.

¹ Lowley O. S. A New Suction Device. Am. J. Surg. 27: 224 (Mar. 1918).

beginning of down on the lips and chin, and the breasts not abnormally enlarged. The pelvis was of somewhat female conformation, with wide iliac crest and upper thighs. The penis was $3\frac{1}{2}$ inches long, with well formed glans, corona and sulcus, a short prepuce partially covering the corona. The

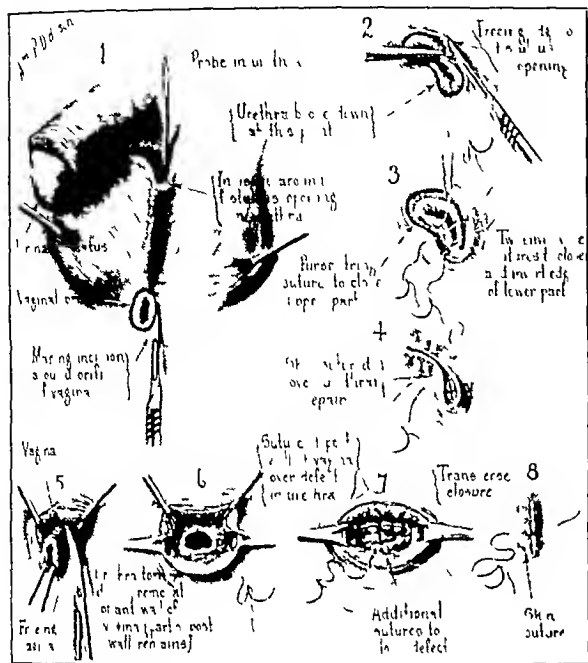


Fig 7—(1) Urethral tube again broke down. Dotted line shows incision around fistulous opening to close defect. Probe in urethra. Making incision around vaginal orifice. Urinary meatus is now at glans penis. (2) Freeing edges of fistulous opening. (3) Upper part of fistulous opening closed with purse string suture and lower part with interrupted sutures. (4) Skin closed over fistulous opening. (5) Removal of vagina. (6) Urethra torn in removal of vagina. Placing suture to close defect. (7) Transverse closure of defect using posterior wall of vagina which had not been removed. (8) Final closure of skin.

shaft was firm and about an inch in diameter, the corpora cavernosa with longitudinal fissure were readily outlined. There was absence of the corpus spongiosum on the ventral surface, its position being occupied by a well marked sulcus resembling a rudimentary urethra and extending from the tip of the penis back to a point directly above the urinary meatus. The tissue lining this groove was nonelastic so that on firm erection (which happened during examination) the penis was pulled downward as in extreme chordee. After subsidence of the erection, a glairy mucus appeared at the meatus. By rectal examination small firm prostatic lobes were demonstrated and the absence of female adnexa was verified. In the inguinal regions the testicles were readily palpated as movable, oval flattened bodies of normal size for the boy's age.

At the age of 17 years the patient, admitted to the Department of Urology (James Buchanan Brady Foundation) of the New York Hospital June 16 1935, complained of an unusual condition of the genitals. He stated that he had never been able to void normally because of the stream of urine posterior to the scrotal tissues. His past history showed that he had always enjoyed good health, that he had had no operations or accidents and that there were no deformities of either parent.

The patient was well developed with male distribution of the genital hair. The external genitalia presented a very unusual appearance. The penis was normal in size but bound down to the scrotum. The testicles were normal in size but completely undescended. At the perineoscrotal junction was a cleft in the tissue, giving the appearance of labia majora. In this cleft was a urinary meatus and just below it a small vagina admitting a No 26 catheter for a distance of approximately 3 cm. Otherwise the appearance was one of masculinity.

CONDUCTION OF CASE

June 18, with the patient under spinal anesthesia, a suprapubic cystostomy was done for urinary drainage and the first stage of the plastic operation for repair of the hypospadias was performed, as follows. With the patient in the lithotomy position, a No 16 catheter was inserted into the bladder through the anomalous urinary meatus in the perineum. Forceps were introduced into the bladder through the suprapubic incision, the catheter pulled up and silk worm gut tied to the catheter, which was then drawn back to the bladder. The anterior wall of the small vagina was opened and made continuous with that of the urethra. A flap of scrotal tissue 6 cm long and 2 cm wide was outlined the end of which formed a cuff around the urinary meatus. The edges were dissected free, leaving the central portion attached to the underlying tissue. The edges of the flap, including the cuff around the meatus were then approximated over the catheter with a silver wire suture. The skin of the scrotum around the edges of the denuded area was loosened and the edges were approximated over the newly formed urethra with silver wire. The catheter was withdrawn and the silk worm gut, which had been previously tied to the catheter was attached to the scrotum at the new meatus. There was little reaction to the operation, and the suprapubic wound healed well. However, the newly formed urethra broke down at the junction with the original meatus, and July 17 under spinal anesthesia the broken down area was successfully repaired by taking some of the mucous membrane from the posterior wall of the vagina and approximating it around the defective portion.

The second stage of the repair was done August 12, with the patient under spinal anesthesia. At this time the mid-portion of the newly formed urethral tube was found to have broken down, but the extreme ends were in good condition. The midportion was repaired, the broken down tissue being used, and the penis was released from the scar tissue on its under surface, so that it was left free to assume its normal position. The glans penis and ventral surface of the shaft were split pulled down over the artificial urethra and sutured in position with catgut. The suprapubic wound continued to drain well, and the silk worm gut was left in the lumen of the artificial urethra.

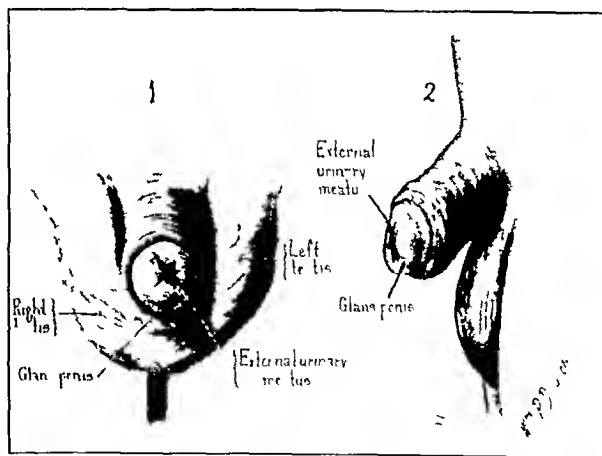


Fig 8—(1) Final result front view. Urethra intact urinary meatus at glans penis. (2) Side view showing final result.

The third stage of the plastic repair was done September 17, with the patient under spinal anesthesia. At this time the penis and newly formed urethra were dissected away from the scrotum. It was found that only the extreme ends of the penis and urethra had united, the remainder of the urethra having sloughed away. The scar tissue was dissected away from the under surface of the urethra and a flap of tissue was taken from the lateral side of the penis for the entire distance of the broken down area. This was rolled over in such a manner that the skin formed the inside of an artificial urethra.

The edge was sutured to the denuded area with silver wire and the ends of the newly formed urethra connected with that of the old giving a continuous tube from the end of the penis to the bladder. The skin of the penile shaft was lifted and sutured over the new urethra with No. 2 plain catgut. There was little reaction to the operation.

However this tube also broke down at the point at which it joined the old artificial urethra, and it was decided to discharge the patient and have him return at a later date for further plastic work.

He was readmitted to the hospital July 2, 1936. Laboratory examinations at this time were negative except for a faint trace of albumin and an occasional red blood cell in the urine.

the right side. Both testicles appeared normal in size and consistency but the epididymides were rather small.

A hemostat was then inserted from the opening beneath the glans out through the tip of the glans and No. 18 sound passed through the new urethra into the bladder and a catheter then passed through the glans opening into the urethra for a distance of 5 cm. The edges of the meatus were denuded and closed in two layers over the catheter which was secured in the urethra by silkworm gut sutures. A chromic catgut purse-string suture was placed about a small opening in the perineum.

Great difficulty has been encountered in securing complete repair of this extensive urethral tube. It has been necessary

Operations for Hypospadias

Case Initials Age	Degree of Deformity	First Stage	Second Stage	Third Stage	General Complications	Local Complications	General Results	New Urethra	Position of Penil	Comment
1 M. R. 30	Penoserotol junction	11/1/32 Cystotomy and first stage repair	12/12/32 Scar dissected from under penis glans split sutured over new tube	12/22/32 Penis and attached new tube dissected free elevated to proper position	None	Fistula at connection of new urethra to normal canal	Good	Perfect	Normal	
2 A. J. 14	Penoserotol junction undescended testicles	6/1/34 Cystotomy and first stage repair			Postoperative shock		Died 6/18/34 3d postoperative day			Pituitary dysfunction
3 H. McM. 22	Meatus 2.5 cm from glans	9/3/34 Cystotomy and formation of new urethra	11/9/34 Penis sutured over new urethra	1/16/35 Penis freed with new urethra	None	None	Good	Voiding normally through meatus in glans	Normal	
4 J. D. 4½	Penis bound to scrotum meatus at penoserotol junction undescended testes	1/18 and 2/13/35 Cystotomy and new tube constructed second tube on 2/13/35	3/6/35 Penis sutured over new tube	10/28/35 Penis freed and fistula closed	None	Several fistulas in new tube	Good	Healed with fistula from it	Somewhat fixed to scrotum	
5 C. L. 25	Penoserotol junction penis bound down	5/3/35 Cystotomy and formation of new tube	6/5/35 Penis sutured over new tube	8/1/35 Penis freed with new tube	None	Fistula developed easily closed	Good	Meatus in glans excellent	Normal	
6 R. P. 17	Rudimentary vagina with meatus in it undescended testicles	6/18/35 Cystotomy and formation of new urethra repaired 7/17/35	8/12/35 Penis sutured over new tube repaired 9/13/35	7/6/36 Orchidopexy and penis freed	None	Patient does not heal well urethral fistula	Good after repair of fistula	Good penis healing testes in scrotum	Some what bound down	Case complete splendid result
7 R. A. 9	Penoserotol junction	5/1/36 Cystotomy and formation of a new tube	6/10/36 Second tube made and penis sutured over it	10/3/36 Penis and new urethra freed from scrotum	None	Development of many fistulas from new urethra	Good	Fistulas closed good repair	Normal	Excellent result
8 D. W. 11	Penis bound down by adhesions urethral meatus just posterior to glans	10/19/36 Cystotomy and formation of new tube	11/2/36 Penis freed from scrotum and tube covered with penile skin	11/25/36 Removal of silk worm gut from urethra and insertion of a catheter	None		Good	Good urethral meatus being dilated	Some what bound down	Good result
9 D. W. S. 27	Meatus ½ inch from glans and bound down	8/3/36 Cystotomy removal of scar tissue and formation of new urethra	3/20/37 Closure of urethral fistulas		None	Development of 2 fistulas which were later repaired	Good			Case complete good result
10 L. J. 11	Penoserotol junction	9/9/37 Correction of penile curvature								Case not complete

July 6 a bilateral orchidopexy and plastic repair of the urethral fistula were done. An incision was made in the left inguinal region extending from the left border of the pubis upward and lateral for 8 cm, to a point over the internal inguinal ring. This was carried through the skin fat and superficial fascia to the external oblique which was incised parallel with its fibers exposing a normal appearing testicle just outside the internal inguinal ring. The tunica vaginalis was incised and part of it cut away exposing the testicle and cord. The cord was then placed on the stretch and the adhesions were carefully dissected away allowing the vas and vessels to stretch out to a point at which the testicle could be placed in the scrotum. A pocket was made in the scrotum by blunt dissection the testicle pulled down into the scrotum and anchored there the internal oblique muscle secured to Poupart's ligament beneath the cord and the external oblique fascia approximated above the cord and the wound closed in layers. A similar procedure was then carried out on

to do minor repairs on seven different occasions but at present the patient passes all urine through the meatus at the end of the penis.

A summary of nine other cases of hypospadias treated by this three-stage procedure are given in the accompanying table.

SUMMARY

By referring to the table it will be noted that since 1932 ten patients with marked hypospadias have been operated on by the new method herein described.

The principles involved in this procedure are (a) diversion of the urinary stream by suprapubic suction drainage (b) careful preoperative anastomosis of the operative site (c) strict asepsis during all steps of the operative procedure (d) prevention of tension on any

of the parts involved (c) avoidance of pressure on the tissues by bandages, hemorrhages, sutures or any other agency

The new urethra is constructed from the flexible skin of the scrotum, joined with silver wire (because of its antiseptic qualities) and turned downward so that the penis is readily attached to it. A piece of silk-worm gut is fixed in the new tube and left until the final stage of the operation.

The second stage of the operation consists in excising the usual scar tissue on the under surface of the penis, fixing the split glans penis around the new meatus and suturing the penis over the new tube.

In the third and final stage the penis and the attached newly constructed urethra are freed from the scrotal bed and brought up to the normal position.

Nine successful operations, performed over a period of five years, warrant a continuation of the method.

The one death in this series resulted from pituitary dysfunction, which was not recognized before operation, in a youth aged 14.

The results obtained on R. P. who is now 19, are spectacular. This young man, thought to be a girl until the age of 5 years and then allowed to reach maturity as a male, was finally subjected to a series of operations extending over the past two years during which a new urethra was made, his imprisoned penis released, his false vagina removed and the undescended testicles reduced to their proper place. His psychologic attitude has been wonderfully changed. As soon as he became convinced that he was to become a regular male, with all parts normal, he began to take part in the usual activities common to high school boys. He gets erections in his newly constructed penis but as yet has never experienced sexual desire.

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ABSTRACT OF DISCUSSION

DR J. EASTMAN SHEEHAN, New York. The paper of Drs. Lowsley and Begg affords an interesting example of the difficulty we sometimes experience in giving a name to this order of surgery. It is plastic in the sense that tissues are used by way of replacement to build up areas other than their own. That term loosely applied, has been adopted by some who have not much claim, and sometimes not any to surgical competence. In other aspects, and perhaps in most, it is better described as reparative surgery and in the present instance it can be designated as reconstructive. Fundamentally of course, it all comes to the same thing: the underlying principle being that the body tissues are adaptable to use in situations other than their own. When it is recognized that skin, fascia, cartilage, bone, muscle, even nerves and vessels, are thus available, the way is opened to surgical intervention of great variety and, what is perhaps more important, to choice and selection with regard to method and replacement material. Drs. Lowsley and Begg provide an illustration of that choice. The literature on hypospadias indicates that usually, in forming the tubule, he has described recourse is had to the penile skin. Dr. Lowsley has varied this by beginning the construction on the scrotal skin. It is a contribution of value to be able as he is to demonstrate that in a series of cases this alternate method has convinced him of its utility. There is one phase of Dr. Lowsley's relation to which in no critical spirit it may be useful to advert. I refer to his mention that at more than one stage there was partial breakdown of the replacement tissue. All of us have had our grievances against grafts that did not behave just as we had wished them to. What we learn in time is that while the skin for instance, gives us service for which we must be grateful, it does so on its own terms. We have to know its demands, in what way each form of replacement accommodates itself to surgical insult and is restored to its original capacity, in what

circumstances resentment is manifested, and what measures are to be taken when such resentment is disclosed. The method of Drs. Lowsley and Begg encounters one of these difficulties. Since it is certain that the skin when raised, will not retain its properties unless the raw edges are either lined with other skin or united to a base and since some pressure is necessary to influence the reorganization, one limitation involved in the scrotal reconstruction is that of providing such pressure. Blair, in his account of the alternate method, indicates that he obtains the pressure by raising the penis to the abdomen and there supplying the pressure, by sponge, in the location that lends itself to immobilization. This recourse is not open to Dr. Lowsley and Dr. Begg and that they have nevertheless succeeded by patience and resourcefulness is just another indication of the fascination this order of surgery has for those who engage in it with full appreciation of the tests of competence it imposes.

TREATMENT OF PRURITUS VULVAE BY ALCOHOL INJECTION

WILLIAM M. WILSON, M.D.

PORTLAND, ORE.

The purpose of this paper is twofold: (1) to substantiate a preliminary report¹ concerning the treatment of pruritus vulvae by alcohol injection and (2) to report the results of four years' experience with the method in forty-nine cases.

Candidates for alcohol injection were selected only after every effort to determine the cause of the pruritus had failed. The majority of the patients had run the gamut of conservative therapy, including the use of



Fig. 1 (case 19)—Pruritus and chronic dermatitis of the vulva and contiguous structures of two years duration in a woman aged 70. For photographic purposes the site of each alcohol injection on the right was marked with indelible ink. Because of impaired circulation a minimum amount of alcohol (2 minims) was injected at wider intervals than usual. The multiple injections thus depicted relieved the pruritus promptly and caused the dermatitis to disappear within a week. Although there has been an occasional mild recurrence during the past three years reinjection has not been necessary.

antipruritic ointments, powders and lotions. Several had received ultraviolet irradiation and roentgen treatments, and one had undergone complete vulvectomy. None of these procedures had elicited more than temporary relief from the itching, which in many cases was becoming intolerable.

The duration of pruritus varied from two months to thirty-five years, the average for the series being

From the Departments of Gynecology and Pathology of the University of Oregon Medical School.
1. Wilson, William M. Pruritus Vulvae. Chronic Vulvitis and Eukoplastic Vulvitis (Kraurosis Vulvae). Treatment by Alcohol Injection. Northwest Med. 33: 268 (Aug.) 1934.

eight and seven-tenths years. The majority of the women at the time of injection were over 45, while the average age for the group was 49 years. The youngest woman was 22 and the oldest 78.

Characteristic changes in the skin were observed in all but a few cases. Regardless of gross changes, however, biopsy specimens of the vulval skin invariably showed microscopic evidence of a chronic subepidermal

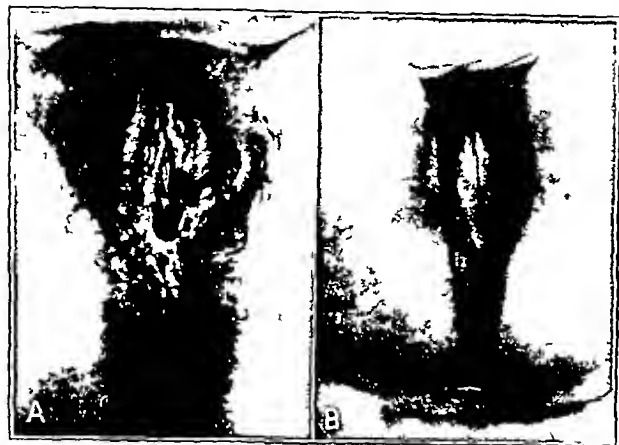


Fig. 2 (case 20)—Pruritus vulvae of ten years' duration in a woman aged 47. *A* taken just before alcohol injection shows the vulval skin thickened, excoriated and discolored. Several small and large ulcerated areas can be seen. Biopsy sections showed chronic vulvitis with hyperkeratosis and marked irregularities in the thickness of the epidermis. *B* taken ten days after injection shows some discoloration of the vulval skin but all excoriations and ulcerations have disappeared. A letter twenty-six months after injection informed me that there had been no recurrence of the pruritus or dermatitis.

infection of various degrees of severity. The pathologic reports in twenty-seven cases were as follows: chronic vulvitis sixteen cases, chronic hypertrophic ulcerative vulvitis one case, leukoplakic vulvitis nine cases and normal vulval skin one case.

TREATMENT

The treatment of pruritus ani by alcohol injection was developed by Harvey Stone² and first reported in 1916. In 1926, after ten years' experience with the method in over 200 cases of pruritus ani, Stone³ concluded that the subcutaneous injection of 95 per cent alcohol properly performed by the technique described would give prompt and complete relief in all cases of pruritus ani. The one objection to this therapy is that the results as a rule are not permanent. In this respect, however, it is not different from all other procedures advocated for the relief of pruritus.

After successfully employing Stone's procedure of therapy for pruritus ani for several years, I decided to try the same method of treatment for pruritus vulvae. The present technique varies little from that described in my preliminary report of 1934.

Technic.—The patient is placed in the lithotomy position, and the vulval and perianal regions are prepared as they would be for surgical treatment except that shaving is not necessary. If one has not previously mapped out the area of pruritus the vulval structures and the contiguous surfaces of the skin should be reviewed to determine the exact extent of the itching. The patient will often point to the areas of most intense itching and neglect to mention parts less involved. For

this reason it is well to quiz the patient concerning the full extent of her annoyance. This precaution is especially important when the pruritus extends to the thighs, the buttocks or the abdominal wall, where characteristic changes in the skin are often less prominent.

The patient is then anesthetized, general anesthesia of some sort being preferable. In the majority of cases in this series the injection was done during nitrous oxide or ethylene anesthesia. During the past year, however, I have employed evipal anesthesia in selected cases and find it adequate for this brief procedure, which usually requires from five to ten minutes for completion. Local anesthesia may be employed, but except for the injection of small areas, infiltration anesthesia is a tedious, time-consuming procedure which is not well tolerated by women of the type affected. Moreover, the ultimate results are seldom as good as when general anesthesia is employed. If one employs local anesthesia, a minimum amount of solution should be used and alcohol injection delayed until the anesthetic solution appears well absorbed. The purpose of these precautions is to prevent a dilution of the 95 per cent alcohol, which, if great enough, interferes with its destructive action on the subcutaneous nerves.

Stone found that 95 per cent alcohol elicited better results and was less apt to produce a slough than weaker solutions. I have substituted absolute for 95 per cent alcohol in a few cases but could detect no difference in the immediate or the ultimate results obtained. The alcohol is injected by means of an ordinary 2 cc hypodermic syringe which is calibrated in minims. Any hypodermic needle of small gauge is satisfactory. I generally use a No. 25 gauge, one-half inch needle. The needle is inserted perpendicular to and through the skin, so that the alcohol will be deposited just beneath the dermis in the subcutaneous connective tissue. An injection into the skin itself or too deeply into the subcutaneous tissues may produce a slough. Only from 2 to 4 minims (0.12 to 0.24 cc) of alcohol is injected at a single insertion of the needle. The

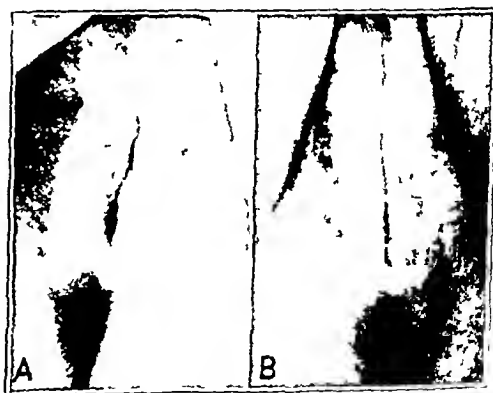


Fig. 3 (case 4)—Pruritus vulvae and ani of twenty-three years' duration in a woman aged 48. Sections of a biopsy specimen confirmed a diagnosis of leukoplakic vulvitis. *A* shows the discoloration and the thickened rigid appearance of the vulva before alcohol injection. *B* the vulva six days after injection. Although the patient was not entirely relieved of pruritus the vulval structures had lost much of their former rigidity and sensitiveness.

number and the spacing of injections depend on the extent of the pruritus, the age of the patient and the condition of her peripheral circulation as well as the estimated efficiency of the circulation of the part to be injected. Elderly patients with arterio-sclerosis or vulval and anal varicosities should be given injection

² Stone, Harvey B. A Treatment for Pruritus Ani. *Bull. Johns Hopkins Hosp.* 27: 306 (Aug.) 1916.
³ Stone, Harvey B. Pruritus Ani: Treatment by Alcohol Injection. *Surg. Gynec. & Obst.* 42: 65 (April) 1926.

cautiously, with a minimum of alcohol (not over 2 minims), at slightly wider intervals (fig 1) than minims), at slightly wider intervals (fig 1) than minims). When the circulation seems unimpaired one may inject as much as 4 minims of alcohol beneath every square centimeter of the pruritic skin. Jacoby⁴ reported good results obtained by injecting alcohol merely around the margins of the pruritic areas. I have employed this

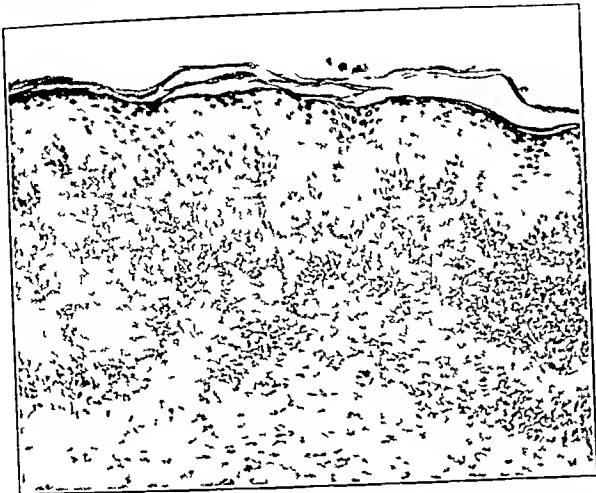


Fig 4 (case 11)—Chronic vulvitis with early leukoplakic changes in a woman aged 60. The pruritus was of eighteen years duration. Note in particular the inflammatory changes (cellular infiltration) in the sub-epidermal layers. This low power photomicrograph was made from a section of a biopsy specimen obtained from the left labium majus just before alcohol injection.

technic but have failed to obtain results comparable to those secured by a more thorough injection of the pruritic areas. Jacoby's object was to cut off sensation and thus eliminate itching, but I shall show later that a mere cutting off of sensation is only one of the values to be derived from the injection of alcohol beneath the skin.

Immediately after injection the labial folds, particularly the labia majora, become more or less edematous. The edema may reach its height in a few hours or may increase slowly, reaching a maximum in from twelve to twenty-four hours. After twenty-four hours it subsides slowly, so that in from three to ten days the vulva usually appears normal, though there is always a certain amount of subcutaneous induration in the region of the labia majora. This likewise subsides slowly, leaving in some cases a chain of small hard nodules, which in turn become smaller gradually and disappear in from four to six weeks.

The itching usually stops immediately, though occasionally one or two small areas of pruritus remain. These are usually areas that were overlooked or improperly treated, and they can be reinjected with the patient under local anesthesia if the itching persists after the edema subsides. As a rule this residual pruritus subsides in a few days or can be controlled with antipruritic ointments until it ceases to annoy.

Few patients have complained of pain after alcohol injection. Two patients complained that for several weeks after injection they were occasionally startled with momentary knifelike pains in the vulva. At first the swollen labia are slightly tender to firm pressure, a condition which occasionally persists throughout the periods of edema and induration. A number of patients

have been slightly annoyed by the numbness which naturally follows degeneration of nerves, but, when questioned as to the severity of this sensation, they invariably admitted that it was as nothing compared to the agony of itching.

Although convalescence in the majority of cases amounts to little more than a recovery from the anesthetic employed, I always instruct patients to remain in bed for at least two or three hours after injection and to go to bed as soon as they reach home. If the vulval swelling becomes uncomfortable hot magnesium sulfate packs may be applied. A number of women have resumed their usual occupations on the day following injection, while some with marked edema of the vulva have found it necessary to remain at rest for two or three days.

Complications—Complications following alcohol injection occurred in two patients (4 per cent). In case 7 a small hematoma developed in the left labium majus during injection. Fluctuation necessitated incision and drainage eleven days later. The resultant wound healed promptly and caused little disability or discomfort. The second complication occurred in an elderly woman, aged 78, who had marked arteriosclerosis and hypertension (case 14). The vulva was atrophied and showed all the macroscopic signs of chronic vulvitis with early leukoplakic changes. The injections were made in the usual manner, about 4 minims of 95 per cent alcohol being deposited at each insertion of the needle. The amount of edema following injection was greater than usual and this further impaired a rather sluggish vulval circulation, causing a slough to develop in the left labium majus. Fluctuation necessitating incision and drainage occurred on the tenth day after injection. The sloughing area healed within ten days and caused no further complications or discomfort. Incidentally, this woman has not had pruritus since the treatment. This experience taught me to

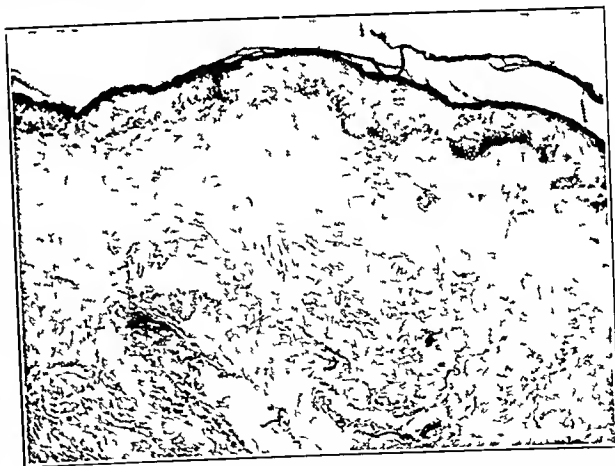


Fig 5 (case 11)—Section under low power of a biopsy specimen obtained from the left labium majus forty days after alcohol injection. Compare with figure 4 and note that the cellular infiltration present before injection has almost entirely disappeared.

inject about half as much alcohol at wider intervals when the circulation, general or local, seems markedly impaired.

RESULTS

Complete Relief—Twenty-five patients (51 per cent) had complete relief from the date of injection to the date when last interviewed, January 1937 (tables 1 and 2).

⁴ Jacoby, Adolph. The Treatment of Pruritus Vulvae with Subcutaneous Alcohol Injections. *Am J Obst & Gynec* 29: 604 (April) 1935.

Partial Relief—Four patients experienced partial relief, all claiming that the itching was less extensive or less annoying than it was before the treatment. For various reasons none of these have been given reinjection.

Recurrences—There have been thirteen recurrences (26.5 per cent) in this series (tables 3 and 4). When

TABLE 1—Results Following Initial Injection

	Number of Cases	Percentage
Complete relief	25	51.02
Partial relief	4	8.17
No relief	2	4.08
Recurrences (see tables 3 and 4)	13	26.53
Unknown	5	10.20
	49	100.00

TABLE 2—Duration of Complete Relief Time Elapsed from Date of Injection to Last Interview

	Number of Cases
3 to 6 months	2
6 to 9 months	3
9 to 12 months	5
1 to 1½ years	3
1½ to 2 years	2
2 to 2½ years	3
2½ to 3 years	1
3 to 3½ years	1
3½ to 4 years	3
	25

discussing this method of therapy with a patient I never refer to it as a cure. I always inform her that it fails occasionally, that some patients are only partially or temporarily relieved and that reinjection may be necessary. All patients given injection are advised to return frequently for observation especially if there is the slightest recurrence. Some recurrences are limited to a single structure of the vulva and can be controlled with antipruritic ointments and lotions, while the majority are more general and necessitate reinjection. Of the patients with recurrences two were given reinjection and are cured to date (January 1937), fourteen months and three and one half years, respectively, after reinjection. Pruritus has recurred in five cases of leukoplakic vulvitis after each of two or more injections. On the basis of this experience I advise against further injection when the first reinjection has failed to elicit relief or has afforded only partial or temporary relief for a few weeks. The present status of recurrences that is when the patient was last interviewed, is summarized in table 4.

Failures—Alcohol injection failed to relieve pruritus in two cases (4 per cent). A review of the history in these cases revealed the fact that burning sensations in the vulva were the major complaint. It was further noted that the vulval skin deviated little if any from the normal and was devoid of scratch marks. Experience with these and other patients of a similar type seen in consultation has led me to advise against injection whenever sensations other than itching form the major complaint. I have seen a number of these women all over 40, and find that the cause in some cases is psychogenic while in others the condition is merely a manifestation of the menopause.

CHANGES OBSERVED AFTER ALCOHOL INJECTION

Macroscopic Changes—The rapidity with which cutaneous lesions heal after this procedure is often surprising. Erosions, ulcerations, fissures, dermatitis and folliculitis heal promptly and disappear in from three to ten days. In other words the thickened, discolored skin showing one or more of these lesions speedily improves in appearance and in the majority of cases approaches the normal within a week (fig. 2). It is not unusual to encounter, associated with pruritus vulvae itching cutaneous lesions on contiguous surfaces such as the thighs and the buttocks and in the neighborhood of the anus. Unless these lesions are too extensive they are usually treated at the same time and in the same manner as those of the vulva.

One woman (case 19) aged 70 came to Dr. Goodrich C. Schauffler with intolerable itching dermatitis of two years' duration, which had resisted all forms of treatment including roentgen therapy. I was consulted, and together we did a unilateral alcohol injection of the vulva and parts of the thigh, buttocks and abdomen (fig. 1). The itching in these parts ceased immediately, and within forty-eight hours the dry, dusky red skin began to pale and superficially desquamate. Within a week the parts first injected appeared normal. This was so encouraging that Dr. Schauffler injected the remaining pruritic skin, and there has never been more than an occasional mild recurrence of the itching, which is readily controlled by local applications of alcohol and zinc oxide ointment. A woman, aged 40 (case 3), with unilateral pruritus of the vulva and itching dermatitis of the left thigh of twenty years' duration was given an injection, and to date there has been no recur-

TABLE 3—Recurrences Time Elapsed Between Injection and Recurrence

	Number of Cases
1 month	4
2 months	2
3 months	2
4 months	1
5 months	2
1½ years	1
2½ years	1
	13

TABLE 4—Status of Recurrence When the Patient Was Last Interviewed

	Number of Cases
Complete relief by reinjection (14 months and 3½ years respectively)	2
Recurrence after each of two or more injections	5
Mild recurrences controlled by antipruritic ointment and lotions	3
Pruritus with intermissions of complete relief	3
	13

rence of the pruritus or the dermatitis. Another woman aged 70 (case 8), complained of pruritus of the right side of the vulva of twenty years' duration. Light years before an ulcer involving the right labium minus and the clitoris developed after the application of a strong solution of mercury bichloride. This failed to heal and was excised a year later. The excision was followed by the development of a hypertrophic ulcerating mass which bled easily and resembled cancer. The lesion however proved to be benign and was

reported as chronic hypertrophic ulcerative vulvitis. The vulva was injected in the usual manner and at widely separated points a few minims of alcohol was deposited beneath the ulcerating mass. The pruritus was immediately relieved and when observed one month later the ulcerating lesion appeared to be shrinking particularly where it had been injected. Thinking

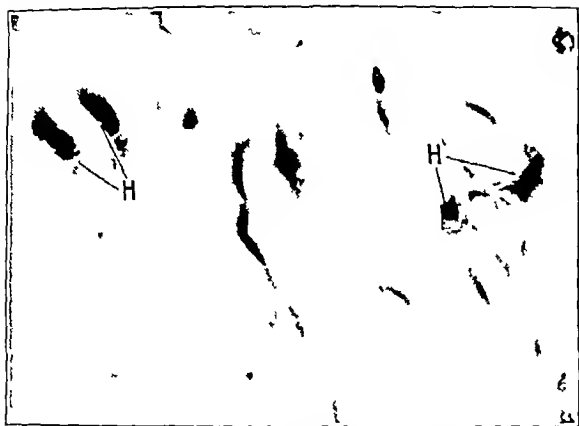


Fig 6 (case 4)—Oil immersion field showing four histiocytes engorged with granules of trypan blue. Histiocytes were present in the dermal connective tissue forty-eight hours after injection of the vulva with alcohol. H indicates histiocytes.

that perhaps the alcohol had something to do with the improvement noted, I injected the lesion more extensively, and within a month the ulcerating mass had completely disappeared, leaving a clean granulating surface which slowly but gradually became epithelized.

While I am not advocating alcohol injection for the cure of leukoplakic vulvitis, it must nevertheless be considered a procedure of value when vulvectomy is contraindicated or permission to accomplish it is refused. Pruritus, one of the chief symptoms of this condition, can frequently be relieved by injections but it is more apt to recur than in cases of pruritus without leukoplakia. The thickened rigid skin of leukoplakic vulvitis softens and except in cases of advanced involvement recovers much of its former elasticity. The rigidity and stenosis of the vaginal introitus observed in cases 4 (fig 3) and 14 were markedly relieved, permitting the introduction of two fingers without pain, whereas on examination before treatment it was difficult to introduce a single digit. Furthermore alcohol injection often causes such a marked reduction in the hyperkeratosis that all macroscopic signs of leukoplakia temporarily disappear.

Microscopic Changes—Biopsy specimens of the vulva were obtained at the time of injection in over half of the cases of this series. These invariably showed definite chronic inflammatory changes in the subepidermal connective tissue. It is interesting to note that these changes were lacking in a specimen obtained from a woman whose chief complaint was of burning sensations in the vulva. In two cases permission was granted to secure a specimen after as well as before treatment. A specimen obtained on the twenty-first day after injection in case 2 showed no evidence of inflammation, and a specimen obtained on the fortieth day after injection in case 11 showed only questionable evidence, an occasional lymphocyte (figs 4 and 5). The disappearance of inflammatory changes is, I believe an important factor in the ultimate success or failure of alcohol injection and of any other therapy designed to cure pruritus vulvae. I am certain that it

it were possible to obtain biopsy specimens within a reasonable time after injection one would find an absence of inflammatory changes in all cases in which the pruritus was cured.

COMMENT

The abrupt cessation of itching following injection is undoubtedly due to the speedily induced degenerative changes elicited in all subcutaneous nerve fibers reached by the alcohol. This explanation, however, fails to explain why the pruritus does not recur as the nerves regenerate, and it does not adequately account for the favorable changes in the skin observed after this therapy. Neurologists have established the fact that subcutaneous nerve fibers regenerate at the rate of about 0.5 mm a day, consequently it should require no more than from two to three weeks for the nerves to regenerate completely. Clinically the absence of numbness and the return of vulval sensation should be adequate evidence of regeneration of the nerves. In the cases reported, vulval sensations were usually normal within three weeks after injection, yet in few cases had the pruritus occurred at that time. It is therefore reasonable to suppose that the factor or factors which previous to injection irritated the nerve endings and produced a sensation of itching had been removed.

It is known from the microscopic changes reported that in two cases at least the subepidermal inflammation present before injection was not present when the biopsy specimen was obtained subsequent to the procedure. When this fact was disclosed I decided to attempt to determine the nature of the process which disposed of the inflammation. For this information a series of animal experiments was begun.

The first experiments involved multiple subcutaneous injections of 95 per cent alcohol in rabbits. Biopsy specimens were obtained at one, two, three, four and seven day intervals after injection. Subepidermal cellular reactions were found in all specimens but the



Fig 7 (case 8)—Oil immersion field showing the presence of histiocytes in the dermal connective tissue beneath an area of chronic hypertrophic ulcerative vulvitis. This section was prepared from a biopsy specimen obtained forty-eight hours after injection of the area with alcohol and trypan blue. H indicates histiocytes.

specimens obtained two days after injection showed the greatest collection of cells composed mostly of polymorphonuclear leukocytes and large mononuclear cells. The presence of large mononuclear cells in numbers obviously suggested activity on the part of the reticulo-endothelial system, with a mobilization of histiocytes. With this in mind I began to experiment

with vital dyes and alcohol. The ability of histiocytes to ingest vital dyes and thus to identify themselves is well known. The following experiments proved interesting.

From 2 to 5 cc of 0.5 per cent lithium carmine or the same amount of 1 per cent trypan blue was injected subcutaneously into rabbits, rats, mice and dogs. From twenty-four to forty-eight hours later the same areas were treated with multiple subcutaneous injections of 95 per cent alcohol, from 2 to 4 minims being deposited at each insertion of the needle. Biopsy specimens obtained twenty-four, forty-eight and seventy-two hours later showed numerous histiocytes throughout the papillary layer of the dermis. Some forty-eight hour specimens showed as many as six histiocytes in an oil immersion field. To determine whether or not the histiocytes observed were other than those ordinarily resident in the tissues I did numerous control experiments employing dyes alone. In no instance in which dyes alone were injected was I able to find more than an occasional histiocyte. Incidentally, the same experiments were repeated with other agents (nutrient broth, 2 per cent quinine and urea hydrochloride, benacol [a proprietary local anesthetic], 1 to 3,000 hydrochloric acid, 5 per cent phenol, 70 per cent alcohol, physiologic solution of sodium chloride and sterile water) which have been recommended for the treatment of pruritus. Of these agents nutrient broth and hydrochloric acid elicited the best histiocytic response but none induced a better response than 95 per cent alcohol.

The next move was to prove that the cellular reactions induced in animals are elicited in human subcutaneous tissues by alcohol injection. To repeat the same experiments in human beings, particularly in a structure like the vulva, obviously offered difficulties, however, with the consent of two patients with pruritus vulvae, I was able to perform the following experiments.

First, 2 cc of 0.5 per cent lithium carmine was injected beneath the skin of one labium majus. Forty-eight hours later the same area was injected with 95 per cent alcohol containing 8 drops of 1 per cent trypan blue to the ounce, 1 cc of the dye-colored alcohol being sufficient to cover this area completely.

This procedure was based on the theory that the histiocytes present in the tissues at the time the lithium carmine was injected would phagocytize and thus become engorged with the dye, while any new histiocytes mobilized by the alcohol would ingest the trypan blue which was deposited with the alcohol. By this differential method of vital staining we hoped to be able to estimate the number of histiocytes present before and after alcohol injection. The soundness of our theory may be questioned, nevertheless, microscopic examination of biopsy specimens obtained forty-eight hours after the injection of alcohol and trypan blue in both cases revealed histiocytes, the majority of which contained granules of trypan blue (figs. 6 and 7). We thus proved to our own satisfaction at least that alcohol deposited beneath the vulval skin causes the mobilization of histiocytes as well as polymorphonuclear leukocytes. I firmly believe that this cellular response to alcohol is the most important factor in disposing of the subcutaneous inflammation and thus the cause in most cases of persistent and recurrent pruritus vulvae.

CONCLUSIONS

1. Alcohol injection is a valuable procedure for the relief of pruritus vulvae and may be effectively employed when more conservative measures fail.

5. Dr. Olof Larzell, professor of anatomy, assisted with advice in the experimental work reported in this paper.

2. The procedure is simple and safe provided one adheres closely to the technique and observes the few precautions described in the text.

3. The clinical observations and the experimental evidence reported indicate that the subcutaneous injection of 95 per cent alcohol in small amounts elicits changes in tissue which are of value in the treatment of pruritus and chronic inflammatory lesions of the skin. Alcohol first induces degenerative changes in the subcutaneous nerve fibers resulting in a cutaneous anesthesia which persists until regeneration occurs. Second and probably more important are the changes actuated in the vascular and the reticulo-endothelial system which result in a rapid mobilization of polymorphonuclear leukocytes and histiocytes, which repair inflammatory processes and thus dispose of the factors principally responsible for the pruritus as well as the cutaneous lesions usually present.

545 Medical Arts Building

VOMITING OF PREGNANCY

A PART OF THE MECHANISM OF PRODUCTION
AND A METHOD FOR ITS RELIEF

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It is generally believed that pregnancy predisposes to disease of the biliary tract. In previous papers one of us¹ was concerned in reports of relief of biliary pain following cholecystectomy. Pain seemed to be due to an increased pressure in the bile ducts resulting from an obstruction at the lower end of the common bile duct due to a muscle spasm. This spasm seemed to be in the muscle in the second portion of the duodenal wall. This spasm and the resulting pressure and pain were relieved by the use of amyl nitrite and glyceryl trinitrate.

Recently in a case of intractable vomiting of pregnancy in which jaundice had begun to develop, it seemed possible that such a spasm might be a causative factor. Glyceryl trinitrate was given after each meal with the result that vomiting stopped and a proposed therapeutic abortion was rendered unnecessary. This experience suggested the study here to be reported.

METHOD OF STUDY

A duodenal tube of the Sawyer type was passed into the duodenum according to the usual method. With the patient flat on her back on the x-ray table the duodenal tube was injected slowly by means of a syringe with a suspension of barium sulfate. When a sensation of resistance was transmitted to the thumb, injection was discontinued and a roentgenogram immediately taken. If no resistance was felt, 40 cc of suspension was injected. Fluoroscopic studies were also made.

From the Service of Dr. J. O. Baker and Dr. I. H. Sprague, Royal Alexandra Hospital.

¹ Butch, Winfield, McGowan, J. M., and Walters, Waltman. Clinical Studies on the Influence of Certain Drugs in Relation to Biliary Pain and to the Variation in Intrabiliary Pressure. *Surg. Gynec. & Obst.* 63: 451-456 (Oct.) 1936. McGowan, J. M., Butch, Winfield, and Walters, Waltman. Pressure in the Common Bile Duct of Man. *J. A. M. A.* 106: 2227-2230 (June 27) 1936. The Use of Glyceryl Trinitrate (Nitroglycerin) for the Control of Pain Following Cholecystectomy. *Ann. Surg.* 104: 1013-1018 (Dec.) 1936. Walters, Waltman, McGowan, J. M., Knepper, Paul, and Smith, A. M. Unpublished data.

RESULTS

Results of roentgenograms which had been made of the duodenum of normal persons and of patients who had suffered from attacks of biliary colic will be reported later by Walters, Knepper, Snell and one of us. Such studies showed the first and second portion of the duodenum in normal persons to be a curved, sausage shaped structure lying to the right of the first, second and third, or the second, third and fourth lumbar vertebrae and completely filled with barium. Ten minutes following subcutaneous injection of morphine the second portion of the duodenum seemed to be in a state of spasm. By injecting the common bile duct by means of a T tube, at the same time as the duodenum was injected with barium, it was demonstrated that this duodenal spasm produced a closure of the lower end of the common bile duct and an increase in pressure within the biliary system.

We performed similar duodenal studies on two patients who suffered from severe vomiting of pregnancy. In each case a marked spasm of the second portion of the duodenum was present (figs 1A and 2A). The pylorus was relaxed, and reflux of barium into the stomach took place. The stomach seemed to lack tone, as evidenced by the low level of the duodenal tube as it crossed the vertebral column. Following inhalation of amyl nitrite, the second portion of the duodenum was relaxed and therefore restored to normal (figs 1B and 2B). Further, the pyloric tone was increased and there was less reflux of barium into the stomach (fig 1B). The gastric tone was improved as evidenced by the fact that the duodenal tube crossed the vertebral column the length of one vertebral body higher in figure 1B than in figure 1A.

The duodenal spasm which is found in the vomiting in pregnancy is similar to that which had been produced by the administration of morphine in normal individuals. Morphine had also produced extreme nausea and sometimes vomiting in a few normal individuals.

CLINICAL APPLICATION

Twelve consecutive patients who suffered from vomiting of pregnancy were treated by means of glyceryl trinitrate (nitroglycerin) $\frac{1}{100}$ grain (0.0006 Gm) under the tongue before or after meals. In these cases the condition was more severe than usual. All the patients had had morning sickness which progressed to severe vomiting. Five of them required hospitalization. It was only after the common methods had failed that treatment with glyceryl trinitrate was started in most cases. The results were uniformly good. All patients ceased vomiting within two days of the onset of treatment, one patient did not vomit once after the drug was used. It was found that taking the drug ten minutes before meals gave more complete relief of nausea than taking it after meals. No untoward effects were noticed except a transient headache of a few minutes duration. We advised the patients to remain in the prone position for ten minutes after placing the tablet under the tongue.

REPORT OF CASES

CASE 1—A married woman, aged 20, related that one year previously she had been pregnant and had vomited so much that at three months her attending physician found it necessary to perform a therapeutic abortion. Her last menstrual period had started Feb. 6, 1937, before she came under our care. February 20 she began to suffer from morning sickness and shortly after this she began to vomit after each meal. This

was before she had missed a menstrual period and before she had any indication that she was pregnant. Vomiting gradually became more severe, and on April 20 it was necessary to admit the patient to the hospital. The treatment at first consisted of 1,000 cc of intravenous fluid containing 8 per cent dextrose in 0.9 per cent saline solution twice daily. In addition to this she was given 2 grains (0.1 Gm) of phenobarbital sodium intramuscularly twice a day. She received nothing by mouth during the first two days in the hospital. She felt extremely nauseated but did not vomit. From April 22 to 26 the patient vomited every day and was continuously nauseated, although she was getting nothing by mouth except sips of water. April 27 intravenous fluids were increased to 1,500 cc twice a day and she was given a light diet. Nausea and vomiting continued. From May 1 to 7 a duodenal tube was kept in place and liquid foods and sedatives were injected through it. May 7 the duodenal tube was removed and phenobarbital sodium and intravenous fluids were continued as before. She was again given a light diet. Glyceryl trinitrate $\frac{1}{100}$ grain was given under the tongue three times a day after each meal. May 8 there was considerably less nausea, but some vomiting was present. May 10 she had slight nausea but no vomiting. She was given a full diet. She vomited only once in the next three days. May 14 glyceryl trinitrate was discontinued. She began to vomit. May 15 a duodenal tube was passed and roentgenograms were made showing very marked spasm of the second portion of the duodenum with reflux of barium into a relaxed stomach. The duodenal spasm was relieved and gastric tone restored to normal by inhalation of amyl nitrite. The administration of

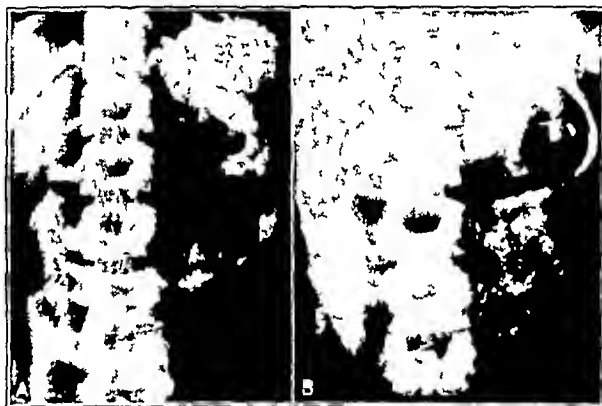


Fig 1—Duodenograms of a patient suffering from the vomiting of pregnancy. A resting state. The first and second portions of the duodenum lie to the patient's right of the second, third and fourth lumbar vertebrae. Barium previously injected is present marking the duodenal rugae. The lumen of the duodenum is obliterated by spasm. Note the reflux of barium into the fundus of the stomach and the great relaxation of the stomach as indicated by the low level of the duodenal tube (40 cc of barium suspension injected). B same one minute after inhalation of amyl nitrite. Note relaxation of the second portion of the duodenum increase in pyloric tone as evidenced by sharp demarcation of first portion of duodenum opposite second lumbar vertebra and no regurgitation of barium into the stomach (40 cc of barium suspension injected).

glyceryl trinitrate was resumed after meals, with continued good results. May 20 she was dismissed from the hospital and instructed to continue with the use of glyceryl trinitrate at home.

CASE 2—A married primipara, aged 20, whose last menstrual period began Feb. 12, 1937, began to suffer from nausea and vomiting about March 10. May 6 she was admitted to the hospital. She was given intravenous fluids and phenobarbital sodium as in case 1. May 10 she was given chloral hydrate 10 grains (0.6 Gm) with sodium bromide 30 grains (2 Gm) twice a day, and one ampule of corpus luteum extract four times a day. In spite of these measures, nausea and vomiting continued until May 17, when all other treatment was discontinued and she was given glyceryl trinitrate $\frac{1}{100}$ grain before each meal. During the next five days she was very little nauseated and vomited on only a few occasions. She was dismissed from the hospital May 23. She continued taking glyceryl trinitrate at home and has been entirely free from symptoms.

CASE 3—A married primipara aged 21 whose last menstrual period began March 23 1937, began suffering from nausea and vomiting May 1. She was admitted to the hospital June 1. Treatment consisted of a high carbohydrate diet two hourly feedings and glyceryl trinitrate $\frac{1}{400}$ grain under the tongue after each feeding. Following this she did not vomit nor was she nauseated. On the morning of June 4 before she had been given any food a duodenal tube was passed and roentgenograms were taken. The results were identical with those in case 1. She was then put on three meals a day consisting of a general mixed diet and was given the usual dose of glyceryl trinitrate after each meal. June 9 she was dismissed from the hospital feeling very well. She had vomited but once since starting the glyceryl trinitrate.

CASE 4—A married primipara aged 17, whose last period began Feb. 22 1937 became nauseated and began vomiting about April 1. She was admitted to the hospital June 4. June 5 she was given a dry diet and glyceryl trinitrate $\frac{1}{400}$ grain was administered under the tongue ten minutes before each meal. She vomited twice June 5 and four times June 6. Since that time she has been entirely free from nausea or vomiting.

CASE 5—A married multipara, aged 23, had not vomited with her first pregnancy. Her last menstrual period began March 8 1937. She became nauseated about April 15 and began vomiting soon after. She was admitted to the hospital May 15. She

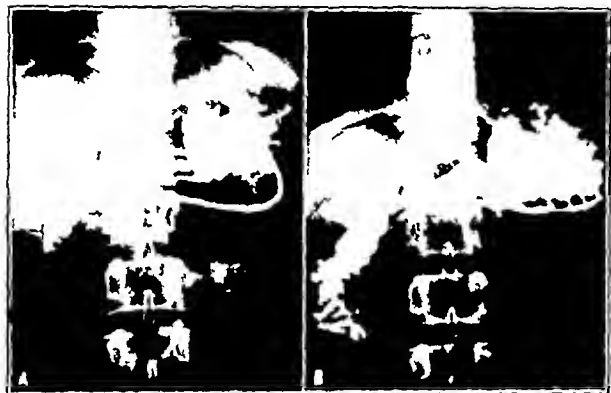


Fig. 2—Duodenograms of a patient suffering from the vomiting of pregnancy. A resting state. Note absence of barium in second portion of duodenum. Barium is prevented from entering the second portion of the duodenum because of the presence of spasm. The pylorus is relaxed as evidenced by the reflux of barium into the stomach (20 cc of barium injected). B same one minute after inhalation of amyl nitrite. The barium now passes down into the relaxed second portion of the duodenum (20 cc of barium injected). This now resembles a duodenogram of a normal nonpregnant woman.

was given a dry diet with fluid limitation by mouth. She was given intravenous fluids and sedatives. In spite of this treatment she continued to vomit as before. May 24 she vomited after breakfast. Ten minutes before dinner she was given glyceryl trinitrate $\frac{1}{400}$ grain following which she did not vomit. Sedatives and intravenous fluids were discontinued. She was then given glyceryl trinitrate ten minutes before each meal. The nausea and vomiting promptly cleared up and she has been well since that time.

In addition to these five cases we have had seven patients in our practice who were treated at home for vomiting of pregnancy by the use of glyceryl trinitrate, with uniformly good results.

COMMENT

The etiology of vomiting of pregnancy is still probably far from being understood. We feel that a duodenal spasm is an important factor which, when overcome, allows the pregnancy to proceed with comfort to the patient. The question is: What causes duodenal spasm? One theory that strikes us is that in pregnancy there is some mechanism, possibly hormonal, which acts on smooth muscle with one type of innervation

by producing spasm and on smooth muscle with another type of nerve supply by producing relaxation, for example, spasm of the cervix, relaxation of the body of the uterus, spasm of the bladder muscle around the lower end of the ureter, relaxation of the ureter, spasm of the second portion of the duodenum and relaxation of the pylorus and possibly of the stomach. When this mechanism becomes exaggerated in one area there is a complication. This would explain preeclampsia as well as hyperemesis of pregnancy.

It is probable that in some cases hyperemesis is so severe that it cannot be relieved by administration of glyceryl trinitrate. Similarly we have found cases of biliary colic due to duodenal spasm of which relief could not be afforded by administration of this drug.

The question might be raised as to whether in these cases the results were attributable only to suggestion. This is partially answered by the fact that in the cases in which the treatment was given at home the results were good. Further the other cases had been in the hospital under other forms of treatment without any result. Of course vomiting of pregnancy has been treated in the past by taking the patient to the hospital, keeping away the relatives and encouraging the patient to hold her food down and success has been reported. Such success could be explained on the basis that by resisting the voluntary part of vomiting the patient could hold food in the stomach until pressure there was sufficiently great to force the gastric contents beyond the duodenal spasm. Further the duodenal spasm is probably worse in times of excitement. This is borne out by the fact that many of our patients who suffer attacks of biliary colic as a result of duodenal spasm state that attacks of pain are more frequent during times of stress. It will probably not be found necessary to continue the use of glyceryl trinitrate very long, as the tendency to vomiting naturally decreases as the pregnancy advances. In the later stages of pregnancy there is an opposite mechanism coming into play. We found that heartburn in late pregnancy was made worse by glyceryl trinitrate.

SUMMARY

Because of the close relationship between pregnancy and the origin of biliary disease and because spasm of the second portion of the duodenum produced by morphine was accompanied in some cases by nausea or biliary colic, it was decided to study the duodenum in patients suffering from the vomiting of pregnancy.

Roentgenologic studies were made of the duodenum in two women suffering from the vomiting of pregnancy. A spasm of the second portion of the duodenum was noted in each case. This was readily relieved by inhalation of amyl nitrite. Glyceryl trinitrate $\frac{1}{400}$ grain under the tongue three times a day before or after meals has been used for the control of vomiting in twelve cases, with consistently good results.

CONCLUSIONS

The vomiting of pregnancy sometimes is associated with a spasm of the second portion of the duodenum with probably a decrease in tone of the pylorus and stomach. Inhalation of amyl nitrite relaxes the duodenal spasm, produces proper emptying of the duodenum into the jejunum and restores gastric and pyloric tone.

Glyceryl trinitrate satisfactorily controls a certain number of cases of vomiting of pregnancy.

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DIAGNOSIS OF HEART DISEASE IN CHILDREN

REGRESSION OF PHYSICAL SIGNS

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The diagnosis of the presence or absence of heart disease is of importance to both the pediatrician and the child. Difficulties in differential diagnosis are encountered frequently enough to warrant a consideration of accepted criteria of diagnosis.

In recent years the clinical significance of a systolic murmur has been unduly minimized. It is frequently stated that about 50 per cent of average normal children present a systolic murmur on routine physical examination.¹ In marked contrast is the reported incidence of organic heart disease, ranging between 1 and 2 per cent. It is obvious that a large group of children, on routine physical examination, present a diagnostic problem.

The criteria essential for a diagnosis of organic heart disease are stated to be (1) characteristic constant physical signs and (2) enlargement of the heart. The reliability of these criteria in determining the presence of organic heart disease, as well as in differentiating acquired and congenital abnormalities, may best be discussed on the basis of analysis of the records of a series of children observed in a cardiac clinic during the years 1916 to 1935, inclusive.

ENLARGEMENT OF THE HEART

The markedly enlarged heart is easily recognized on physical examination. The differentiation between the normal and the moderately enlarged heart in the child presents a diagnostic problem of clinical importance. It has recently been recognized that the determination of enlargement of the heart by examination of the frontal plane alone, either by percussion or by mensuration, is of limited value and that additional exami-

tion of the frontal plane in only about one third of a group of 148 children with mitral insufficiency, as compared with four fifths by examination in the oblique views. The two measurements limited to the frontal plane revealed enlargement in about one half of sixty-seven subjects with multiple valvular lesions as compared with nearly 100 per cent by examination in the frontal and oblique views. In children with congenital heart disease it was found that on fluoroscopic examination the cardiac silhouette is often more characteristic than physical signs (table 1B). These observations demonstrated that unless roentgenologic examination of the heart is made in the frontal and in the oblique views, the presence of moderate enlargement of the heart may not be determined.

PHYSICAL SIGNS

There have been many attempts to define and describe the benign systolic murmur heard in the second, third and fourth left interspaces or at the apex in normal children. It has been emphasized that in organic heart disease the systolic murmur is constant and usually characteristic in location, quality and transmission. Analysis of the physical signs recorded on successive examinations of children with congenital and acquired organic heart disease is of interest.



Fig. 2 (case 1).—Teleroentgenogram of patient D. L. (congenital heart disease).

REGRESSION OF PHYSICAL SIGNS

Congenital Heart Disease.—In table 1 A and B are summarized the physical signs and symptoms recorded for a series of children with congenital heart disease (groups I and II). In 60 per cent of cases of congenital heart disease associated with cyanosis and characteristic physical signs, the thrill and cyanosis disappeared, in 30 per cent the murmur changed in character and transmission, being indistinguishable from the so-called benign systolic murmur in seven instances. It is of interest that the fluoroscopic examination of the cardiac silhouette remained unchanged. For groups III and IV differential diagnosis is particularly difficult, since the character of the murmur is consistent with that of mitral insufficiency or with that of a "benign systolic murmur." There was regression of physical signs in twenty-one instances, or 36 per cent (fig. 1). On fluoroscopic examination it is usually possible to make a differential diagnosis. In all but five cases an abnormal cardiac basal silhouette was observed. Enlargement of the pulmonary conus and ventricles was found in all. Two illustrative cases are presented.

CASE 1—D. L., at the age of 10 years, showed a systolic murmur in the second, third and fourth left interspaces on

5 A benign systolic murmur of unknown origin is also commonly referred to as an accidental murmur or a cardiorespiratory murmur. This type of murmur does not include a systolic murmur which is heard in children with anemia or during toxic or febrile periods, such a systolic murmur is due to relative insufficiency and is more correctly termed a murmur.

PHYSICAL SIGNS			REGRESSION		
CYANOSIS	10	→	6	—	
THRILL	10	→	6	—	
<u>CHARACTER OF MURMUR</u>					
RUMBLING	r	5	→	1	S
HUMAN TOP	H	4	→	2	S
LOUD	L	8	→	3	S
ROUGH	R	14	→	6	S
MUSICAL	M	7	→	2	S
NO CHARACTER	ATI N S	19	→	4	S
			1	L	
TOTAL	57	→	21		

Fig. 1.—Regression of physical signs in congenital heart disease.

nation for chamber enlargement in the oblique views is essential.² In a previous study⁴ it was reported that enlargement of the heart was determined by examina-

This investigation was aided by a grant from the Commonwealth Fund from the New York Hospital and the Department of Pediatrics, Cornell University Medical College.

Read before the Section on Pediatrics at the Eighty-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1937.

¹ Holt, L. Emmett Jr. and McIntosh Rustin. *Holt's Diseases of Infancy and Childhood*, ed. 10. New York: D. Appleton & Co., 1932, p. 496.

² Criteria for the Classification and Diagnosis of Heart Disease, ed. 3. New York: New York Tuberculosis and Health Association, 1935, pp. 4 and 40.

³ Criteria for the Classification and Diagnosis of Heart Disease, ed. 4. Wilson, May G. *Clinical Radioscopic Studies of the Heart in Children*. Roentgenologic Criteria of Cardiac Enlargement. *Am. J. Dis. Child.* 47: 50-763 (April) 1934.

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routine physical examination at school. On percussion the heart did not appear enlarged. Mensuration of the teleroentgenogram was within normal limits. There was slight fullness of the pulmonary conus. Fluoroscopic examination revealed a marked convex pulmonary conus (fig 2). In the oblique views there was enlargement of the right and left ventricles. It is of interest that this child was examined at two other clinics where

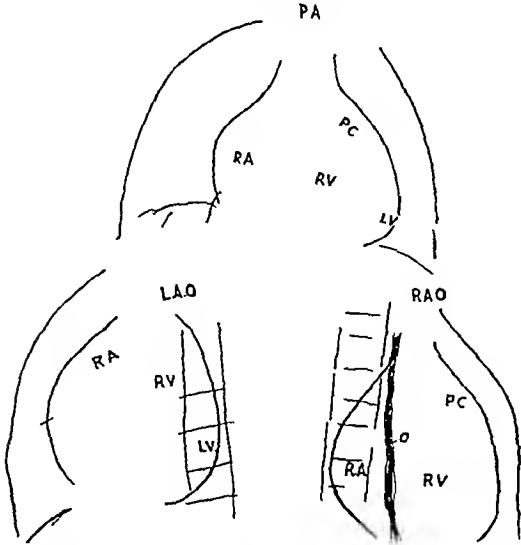


Fig. 3.—Fluoroscopic tracings of patient E. B. in frontal and oblique views.

the heart was not found to be enlarged (diagnosis based on a teleroentgenogram of the frontal plane) and the murmur was considered "benign."

CASE 2—E. B., a girl, aged 7 years, was first known to have heart disease in January 1935, when, at the age of 6 years, she suffered from mild rheumatic polyarthrits. In June 1935 on her first admission to the New York Hospital, on the basis of history, physical examination and teleroentgenogram the diagnosis of rheumatic heart disease and mitral stenosis was made. On subsequent fluoroscopic examinations (fig 3), marked enlargement of the right auricle and right ventricle, slight enlargement of the left ventricle and a normal left auricle were demonstrable in the oblique views. The diagnosis

Acquired Heart Disease.—There is general agreement that the heart is probably always involved to some degree in rheumatic fever. It is a common observation that, during active rheumatic carditis, characteristic physical signs of valvular disease may disappear or appear for the first time. During convalescence the physical signs previously found are again resuscitated, and new murmurs which have appeared may persist or disappear. These changing physical signs are probably due largely to dilatation of the chambers of the heart rather than to valvular disease.⁶ However, it is not fully appreciated that during subsequent years characteristic physical signs may regress and become indistinguishable from a systolic murmur which is so frequently considered of little clinical significance. In table 2 and figure 4 is presented a summary of the physical signs recorded for children with rheumatic heart disease during the period of observation. In the analysis of the records the physical signs present during acute carditis were not included.

The Systolic Murmur in Mitral Insufficiency and Mitral Stenosis.—In only 11 per cent—group I—of a series of 179 subjects with mitral insufficiency did the

CARDIAC ENLARGEMENT				GROUP		
MITRAL INSUFFICIENCY ONLY		I	45%	95%	+	20 CASES
		II	40%	80%	+	15 CASES
		III	45%	95%	+	11 CASES
		I	3%	96%	+	41 CASES
MITRAL STENOSIS		II	0%	74%	+	17 CASES
		III	0%	74%	+	
		III	0%	74%	+	

+

++

+++

SLIGHT ENLARGEMENT

MODERATE

MARRED

characteristic at each examination, in 6 per cent—group II—it was inconstant, and in 40 per cent—group III—it became uncharacteristic at times. As in the series with mitral insufficiency alone, the murmur first became uncharacteristic within a year in the majority of the patients. During the time when the murmur was absent

TABLE 1—*Congenital Heart Disease*

Period of observation from two to sixteen years
Age range from seven to twenty four years

	Group I* Number	Group II† Number	Group III‡ Number	Group IV§ Number
A Regression of Physical Signs				
Total number of cases	10	10	24	13
Heart disease not of birth	9	1	4	3
Rheumatic history...	3	7	24	
Cyanosis present	10			
Cyanosis disappeared	6			
Thrill present	6	10		
Thrill disappeared		6		
Character of murmurs				
Rumbling (r)	1	3	1	
Regression		(1 s)		
Humming top (H)	2	2		
Regression	(2 s)	(1 r)		
LOUD (L)		3	4	1
Regression		(2 s)	(1 s)	
Rough (R)	5	1	6	2
Regression	(1 s)	(1 s)	(3 s)	(1 s)
Musical (M)			3	4
Regression			(1 s)	(2 R)
No characterization (s)	2	1	10	6
Regression		(1 L)	(2 s)	(2 s)
Total murmurs showing regression	3 (30%)	6 (60%)	7 (29 1%)	5 (46 1%)
B Fluoroscope and Electrocardiographic Examination				
Total number of cases	10	10	24	13
Enlargement of the heart on physical examination	9	7	12	9
At anomalies noted on fluoroscopic examination				
Base	10	8	15	11
Pulmonary artery	6	3	8	3
Aorta	4	3	9	4
Pulmonary conus	8	9	16	8
Right ventricle	7	7	12	5
Right auricle	2	1	2	2
Left ventricle	9	7	15	7
Left auricle	1	1	2	
Electrocardiographic examination				
Axial deviation				
Left	2	3	1	1
Right	3	1		1
None		3	12	3

* Cyanosis present

† Thrill present

‡ Associated rheumatic history absence of cyanosis and thrill

§ Absence of rheumatic history absence of cyanosis and thrill

or uncharacteristic, a diagnosis of mitral insufficiency would probably not have been made. It is of interest that the series with constant and characteristic physical signs showed the highest incidence of active carditis (table 3, fig 4). The enlargement of the heart was less in the group in whom the physical signs had regressed (table 4, fig 5). These observations indicate that valvular damage and myocardial damage were probably minimal in these patients. It is of prognostic importance, however, that the subjects presenting a characteristic or an uncharacteristic systolic murmur subsequently had mitral stenosis (in the absence of recognizable active carditis) with equal frequency.

The Diastolic Murmur in Mitral Insufficiency and Mitral Stenosis—In 35 per cent—group I—of a series of 118 patients with mitral insufficiency and mitral stenosis, the diastolic murmur was constant and characteristic, and in 65 per cent—groups II and III—uncharacteristic or inconstant. Enlargement of the left auricle was noted during both the presence and the absence of the diastolic murmur. The enlargement of the heart was greater and the incidence of active carditis

higher in the group in which the diastolic murmur was constant and characteristic (tables 5 and 6, fig 5).

The regression of physical signs in the course of rheumatic heart disease is illustrated by the following protocols.

CASE 3—E. D., a girl, aged 12 years, was observed from birth. The mother had chorea as a child. The patient's heart was normal from birth, her infancy was uneventful. During the three years preceding the onset of rheumatic fever she had whooping cough and suffered three infections of the respiratory tract. On April 20, 1929, at the age of 4 years, she complained of pain in her legs. During the next few days she had a fever and symptoms of acute carditis, followed by chorea and rheumatic nodules. These symptoms of active infection subsided in April 1930. During the acute carditis the heart appeared enlarged on percussion and there was a loud systolic murmur. Roentgenographic examination confirmed the pres-

TABLE 2—*Acquired Heart Disease, Regression of Physical Signs*

	Mitral Insufficiency		Mitral Insufficiency and Mitral Stenosis			
			Systolic		Diastolic	
	Number	Percentage	Number	Percentage	Number	Percentage
Group I Systolic murmur characteristic and constant at all times	20	11	73	54	41	35
Group II Characteristic systolic murmur not always constant	15	8	8	6		
Group III Systolic murmur not always characteristic or constant	144	81	54	40	77	65
Total	170	100	135	100	118	100

TABLE 3—*Rheumatic Manifestations in Relation to Regression of Physical Signs (Mitral Insufficiency)*

Duration of disease from two to sixteen years mean six and two tenths

		Manifestations of Infection											
		Active Carditis		Subacute Carditis		Polyarthritides		Chorea		Joint Pains		None	
Group	Total	No	%	No	%	No	%	No	%	No	%	No	%
I*	20	4	20	2	10	2	10	6	30	2	10	4	20
II†	15	1	7	0	0	8	53	4	27	2	13	0	0
III‡	144	3	2	11	8	42	29	48	33	35	24	5	4
Totals	179	8	5	13	7	52	29	58	32	39	22	9	5

* Group I Systolic murmur characteristic and constant

† Group II Systolic murmur characteristic but inconstant

‡ Group III Systolic murmur not always characteristic or constant

TABLE 4—*Regression of Physical Signs in Relation to Degree of Cardiac Enlargement (Mitral Insufficiency)*

Systolic Murmur	Total		Degree of Enlargement					
			+		++		+++	
	No	%	No	%	No	%	No	%
Murmur characteristic at all times								
Constant (I)	20	100	9	45	11	55		
Inconstant (II)	15	100	6	40	9	60		
Murmur not always characteristic or constant (III)	144	100	93	65	51	35		
Totals	170	100	108	60	71	40		

ence of cardiac enlargement. During the next two years and until her second attack of rheumatic fever, in November 1932, the child was well except for occasional joint pains. At physical examination no enlargement of the heart was found on percussion or on mensuration of the frontal plane of the cardiac silhouette. Oblique views demonstrated enlargement of the right and left ventricles and of the left auricle. The systolic murmur was heard only at the second and third left interspaces.

In November 1932 the patient experienced another rheumatic episode, characterized by tonsillitis, erythema multiforme, polyarthritides, acute carditis, rheumatic nodules and chorea. This episode continued until July 1934. During this period the systolic murmur was heard at the apex and widely transmitted, and a diastolic murmur was also present at the apex.

TABLE 5—Regression of Physical Signs in Relation to Degree of Cardiac Enlargement (Mitral Insufficiency and Mitral Stenosis)

Diastolic Murmur	Degree of Enlargement							
	Total		+		++		+++	
	No.	%	No.	%	No.	%	No.	%
Group I. Murmur characteristic and constant during period of observation on every examination	41	34.8	1	2.4	14	34.1	26	63.5
Groups II and III. Murmur in constant or questionable on some examinations	77	65.2	6	7.8	57	74.0	14	18.2
Total	118	100.0	7	5.9	71	60.2	40	33.9

Marked enlargement of the heart, apparent on percussion, was confirmed by roentgenographic examination. During 1935, 1936 and 1937 she remained well and free from symptoms of rheumatic activity. The systolic murmur became uncharacteristic and was heard only in the second and third intercostal spaces. The diastolic murmur was inconstant. On percussion and on mensuration of the frontal plane of the cardiac silhouette, the heart was found not to be enlarged. In the oblique views (fig. 7) enlargement of all the chambers of the heart was noted. It is evident that during 1932, 1935, 1936 and 1937 organic heart disease would not have been diagnosed on the basis of physical examination or mensuration of the frontal plane of the cardiac silhouette.

CASE 4—F L, a boy who was first observed in June 1929, at the age of 10 years, and who died at the age of 17 (August 1936) of subacute bacterial endocarditis, was referred to the clinic because of a systolic murmur, which had been found on routine physical examination (fig. 8). A sister had rheumatic fever. His past history was not remarkable except for tonsillitis at the age of 5 years and tonsillectomy and appendectomy at the age of 6. No enlargement was found on percussion or on mensuration of the frontal plane of the cardiac silhouette. (Examination of the oblique views was not made at this time.) A systolic murmur was present, best heard in the third left interspace.

TABLE 6—Rheumatic Manifestations in Relation to Regression of Physical Signs (Mitral Insufficiency and Mitral Stenosis)
Mean duration of disease seven and nine tenths years

	Manifestations of Infection											
	Total		Active Carditis		Sub-acute Carditis		Polyarthritides		Chorea		Joint Pains	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Group I*	41	100	27	65.8	7	17.1	3	7.3	3	7.3		
Groups II† and III‡	77	100	24	31.1	11	14.3	21	27.3	11	14.3	7	9.1
Total	118	100	51	43.3	18	15.2	24	20.4	14	11.9	7	5.9

* Group I. Diastolic murmur characteristic and constant.
† Group II. Diastolic murmur characteristic but inconstant.
‡ Group III. Diastolic murmur not always characteristic or constant.

From 1929 until 1932 the systolic murmur was at times heard equally well at the apex, at other times it was heard only at the base. During this period the child complained occasionally of indefinite pains in the legs and of "nervousness." At no time were choreiform movements observed. From 1932 to 1935 inclusive he was well attended high school and did not return to the clinic for observation. On Nov. 9, 1935 he visited the clinic to obtain glasses. On examination the systolic murmur was heard equally well at the base and the apex. No enlargement of the heart was found on percussion,

but fluoroscopic examination showed an enlarged and convex pulmonary conus, enlargement of the left and right ventricles and retrodisplacement of the esophagus by an enlarged left auricle.

In February 1936 the boy suddenly complained of blurred vision, nausea and some joint pains. When seen in April 1936 he was pale and had a systolic murmur and a presystolic murmur at the apex. The spleen was palpable, there was marked secondary anemia and red blood cells were present in the urine. Subsequent blood culture revealed *Streptococcus viridans*. On postmortem examination, in addition to the characteristic subacute bacterial endocarditis, chronic mitral stenosis and insufficiency were observed. Both leaflets of the mitral valve were moderately thickened, with only slight rolling of the free edge. The appearance of the mitral valve suggested a moderate degree of insufficiency and stenosis. The chordae tendineae were moderately thickened.

In this case the diagnosis of organic heart disease (based on the usually accepted criteria) could not have been made until April 1936, four months before the patient's death. However, on fluoroscopic examination in November 1935, enlargement of the left ventricle, right ventricle and left auricle were demonstrated. A diagnosis of mitral stenosis was made, which was con-

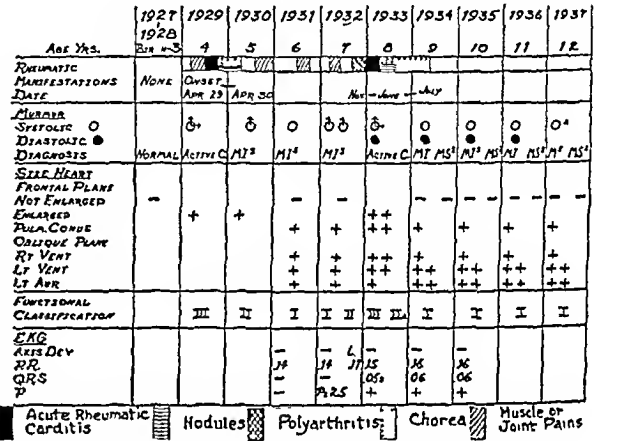


Fig. 6 (case 3)—Course of rheumatic heart disease. MI² or MS = murmur inconstant, MI³ or MS³ = murmur uncharacteristic.

firmed at autopsy. The postmortem appearances indicated that mitral insufficiency and stenosis were of not less than a year's duration.⁸

COMMENT

The occurrence of a "benign systolic murmur" of unknown origin, unassociated with recognizable abnormality of the heart, is not questioned. However, the frequency of its occurrence in children would seem to be overestimated.

It is obvious from the reported observations, based on successive examinations of children with congenital and acquired organic heart disease, that the physical signs are not necessarily constant or characteristic in location or transmission. The murmur was indistinguishable from the so-called benign systolic murmur in the majority of children at some time during the period of observation. The importance of the recognition of moderate and slight enlargement of the heart in such children is obvious. It has been demonstrated that examination of the heart, either by percussion or by mensuration of the frontal plane, will not reveal slight or moderate enlargement in a large percentage of children with organic heart disease. The recognition of chamber enlargement, particularly by retrodisplacement

⁸ Personal communication from Prof. Robert Moore, Department of Pathology, New York Hospital, Cornell University Medical College.

of the esophagus by an enlarged left auricle in the right anterior oblique position, is of value in the diagnosis of mitral stenosis. Certain types of congenital heart disease can be recognized only on fluoroscopic examination. Since adequate roentgenologic examination is not as yet a routine procedure, it is apparent that slight and moderate enlargement of the heart may not always be recognized. The regression of characteristic physical signs of organic heart disease and the inability to recognize slight and moderate enlargement make it difficult to differentiate between a "benign systolic murmur" and a systolic murmur of organic heart disease.

It would seem likely that in children with rheumatic heart disease presenting regression of physical signs, valvular damage is minimal. This theory is supported by the observation that the incidence of active carditis was lower and the enlargement of the heart was less in the series of subjects in whom the physical signs were inconstant and uncharacteristic. The prognostic significance, however, is not certain, since subjects showing regression of physical signs and subjects presenting constant characteristic murmurs subsequently had with equal frequency mitral stenosis in the absence of recognizable acute carditis. This fact is illustrated by the protocol of patient 4, in whom the physical signs were uncharacteristic prior to his final illness (subacute bacterial endocarditis). Postmortem examination revealed the presence of chronic mitral insufficiency and stenosis.

Since the reported incidence of organic heart disease depends on the criteria of diagnosis utilized, these observations should be of more than academic interest. It is probable that heart disease is more prevalent than reports in the literature indicate. The reported incidence of organic heart disease of from 1 to 2 per cent may

genital and acquired, observed during the years 1916-1935 inclusive, revealed that characteristic murmurs may become uncharacteristic or inconstant at times. Persistent chamber enlargement and abnormality of the cardiac silhouette were demonstrable when the physical signs were inconstant or uncharacteristic. The diagnos-

FL AGE	1919	10 1929	1930	1931	1932	1933	1934	1935	17+ 1936
RHEUMATIC MANIFESTATION	No								2/3/36 SUBACUTE BCT ENDOC
DATE	1928								
SIGNS		O ^s	O ^s	O ^s	O ^s			O ^s	O ^s
DIAGNOSIS		IV	IV	IV	IV			MIM ^s	MIM ^s
SIZE HEART									
FRONTAL PLANE									
NOT ENLARGED		-	-	-	-			-	-
ENLARGED		+	+	+	+			++	++
PULMONARY CONGESTION								+	+
OBSCURE P								+	+
ENLARGED VENTRICLE								+	+
LA AT								+	+
FOR TIT L									
CAT		I	I	I	I	I	I	I	II III
EKG									
A: Dev									None
QRS									1/2
P									OS
P ST									
M TEM									CHRONIC MITRAL STENOSIS IN EFF

Fig 8 (case 4)—Course of rheumatic heart disease

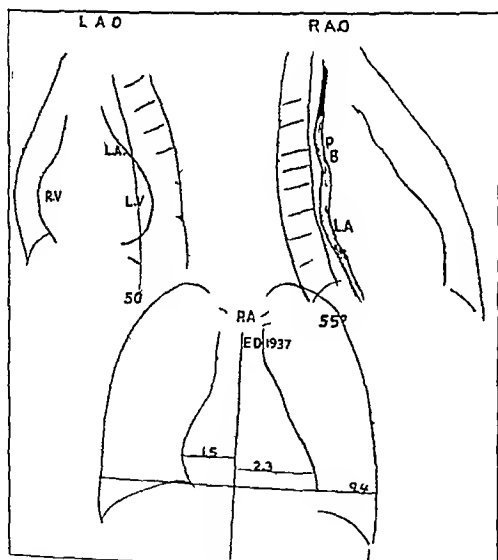


Fig 7 (case 3)—Fluoroscopic tracings of cardiac silhouette

include only children with constant physical signs and marked enlargement of the heart.

It is to be emphasized that this study has been limited to a consideration of certain criteria essential in arriving at an anatomic diagnosis of organic heart disease, namely, physical signs and enlargement of the heart.

SUMMARY

Analysis of the physical examinations recorded for a series of children with organic heart disease, con-

tic value of roentgenologic examination in the oblique views was confirmed by the postmortem appearances in two patients.

In 36 per cent of fifty-seven children with congenital heart disease, characteristic physical signs regressed.

In only 11 per cent of 179 children with mitral insufficiency was a characteristic constant systolic murmur present at each examination. In 81 per cent the systolic murmur was at times indistinguishable from the so-called benign systolic murmur. In about 60 per cent of 135 children with mitral insufficiency and mitral stenosis, the systolic murmur was characteristic, and in about 40 per cent uncharacteristic.

In only about 35 per cent of 118 children with mitral insufficiency and mitral stenosis was the diastolic murmur constant and characteristic. In 65 per cent, when the murmur was inconstant or uncharacteristic enlargement of the left auricle was demonstrable.

CONCLUSIONS

1 In children with congenital or acquired heart disease the physical signs may at times be inconstant and uncharacteristic in the presence of abnormality of the cardiac silhouette and chamber enlargement.

2 The systolic murmur in children with organic heart disease may be indistinguishable from a so-called benign systolic murmur.

3 In evaluating the significance of a precordial systolic murmur, roentgenographic examination of the frontal and the oblique planes of the heart is essential.

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ABSTRACT OF DISCUSSION

DR WILLIAM D. STROUD, Philadelphia: Systolic murmurs in themselves are of little importance in children from the standpoint of circulatory efficiency. This is rather a bold statement. The pendulum of opinion following the war swung toward the attitude that systolic murmurs were of little importance, but recently Dr. Levine of Boston and others have sug-

gested that they are of more importance than previously thought. Yet from the practical standpoint of the treatment of the child, I am sure a physician can do more by reassuring the mother and taking an optimistic attitude than by making the child introspective, preventing him from activities which he can well carry on and making the parents continuously apprehensive. By a systolic murmur I mean the type of murmur that occurs accidentally in the pulmonic area, and the short systolic murmur in the mitral area even though there may be a history of rheumatic etiology. Such a statement predicates the absence of marked enlargement of the heart, or rheumatic activity as evidenced by loss of weight, nervousness and sleeplessness. In the presence of a systolic murmur, even at the apex, in the heart of a child who is developing normally, it seems to me that the youngster should be allowed to carry on a normal life until some evidence is found of reactivation of the rheumatic state. Dr. Wilson has shown how often these murmurs regress. But even if they do not regress it has been my experience in seventeen years in following a great many children in heart clinics and in private practice that these children develop better generally and their hearts show less damage over a period of years than might have been imagined from the intensity and character of the murmur. I should like to leave this optimistic thought. So long as they develop normally and are kept under close observation so that one does not miss the evidence of a rheumatic reactivation, no restriction need be placed on these youngsters from the standpoint of physical activity.

DR. HYMAN GREEN, Boston. In children with acquired or congenital heart conditions, the x-ray shadow is helpful. By comparing the x-ray contour with roentgenograms of cases proved at autopsy, diagnosis of congenital cardiac disease is made more accurately with the roentgenogram and the electrocardiogram. Heretofore the character and the location of a murmur differentiated congenital from acquired disease. Marked enlargement of the cardiac shadow by x-ray examination was formerly called idiopathic hypertrophy. With increased knowledge of cardiac hypertrophy, von Gierke's disease and avitaminosis must be considered. In older children congenital and acquired heart disease are difficult to differentiate. Cases seen by several men were diagnosed once as congenital and later as acquired. The history may be misleading. An unusual x-ray contour favors the diagnosis of congenital disease. In certain cases fluoroscopy aids in distinguishing the chambers of the heart and the great vessels. Familiarization with the normal is important before movements of the actively beating heart can be properly interpreted under the fluoroscope. As a permanent record a good x-ray film is preferable to fluoroscopy. A roentgenogram shows enlargement more accurately. In acquired heart disease, x-ray examination is not so valuable. In mitral stenosis, prominence of the upper left border is due to dilatation of the left auricle. Right or left ventricular enlargement is easily distinguished. The shadow of a pericardial effusion is distinctive. The electrocardiogram in rheumatic heart disease demonstrates early changes in the myocardium by a prolonged PR interval and an RT segment close to the base line. It is helpful in heart block, auricular fibrillation and paroxysmal tachycardia. In practice an electrocardiogram is unnecessary. The diagnosis of mitral stenosis is made too frequently. A mid diastolic murmur of rheumatic carditis is due to dilatation and hypertrophy and not to mitral valve scarring. Buttonholing of the mitral orifice develops with years. Mitral stenosis of rheumatic fever is seen rarely at autopsy. The heart is easily dilated in children. It is frequent in various forms of anemia. The symptoms and signs are like those of rheumatic fever, but careful diagnosis is necessary before anemia can be classified and treated. If the anemia is curable, a dilated heart will later become normal in size. Several years ago a survey was made of congenital heart disease from the point of view of prognosis. Some of the patients were 20 years of age. In a large number with murmurs in infancy and a poor prognosis the murmur had disappeared. Our cardiac clinic discharges patients to the adult clinic at the age of 12. A surprising number graduate without murmurs, even patients with rheumatic pericarditis.

Clinical Notes, Suggestions and New Instruments

ALLERGY TO LIVER EXTRACT

LEO H. CRIEP, M.D., PITTSBURGH

Allergy to liver extract required as a result of injections received for the treatment of pernicious anemia is reported in American literature only twice. The report by Metzger¹ describes an asthmatic reaction following administration of liver extract. The second report, by Held and Goldbloom,² describes the development of urticaria, which is thought to be due to the accumulation of uric acid. No studies were carried out in these two cases to determine the nature of the immunologic response involved in this type of sensitivity.

Four reports appear in the foreign literature. Roovers³ reports several instances in which asthma, urticaria and other unpleasant reactions developed in patients receiving liver extract by injection. Engel⁴ describes a reaction consisting of marked weakness, imperceptible pulse, vomiting and a skin rash immediately after an injection of liver extract in a patient who had been receiving liver by injection for a period of one month. This patient showed positive skin reactions to liver and could tolerate liver by mouth. Desensitization was attempted. Lasch⁵ cites two instances of allergy to liver extract, consisting

TABLE 1—Intradermal Tests One Month After Reaction
Determination of Skin Sensitivity

Dilution	Lilly	Parke Davis & Co.	Saline Solution	Control (Six Normals)
1:10	Marked	Moderate	Negative	Slight
1:100	Marked	Moderate	Negative	Negative
1:1,000	Moderate	Moderate	Negative	Negative
1:10,000	Moderate	Negative	Negative	Negative
1:100,000	Slightly +	Negative	Negative	Negative

chiefly in urticarial manifestations. One patient gave positive skin reactions and a positive passive transfer to liver. Schlesinger⁶ reports another instance of angioneurotic edema following administration of liver extract. Grun⁷ discusses the subject in two articles appearing in 1933 and 1934 and refers to a case of pernicious anemia in which intramuscular injections of liver extract were followed by sudden reactions. These occurred after the second week of treatment and were characterized by generalized erythema, dyspnea, weakness and vomiting. The patient gave a positive intradermal reaction to liver extract in a dilution of 1:1,000, he also gave a positive passive transfer.

My purpose in this paper is to report an instance of allergy to liver extract and to indicate the nature of the immunologic response mediating this type of sensitivity.

REPORT OF CASE

A white man, aged 41, has a long standing history of ragweed hay fever as well as a history of clinical sensitivity to various foods. The ingestion of strawberries gives him urticaria. He gets severe gastro-intestinal upsets, with nausea, vomiting and

From the University of Pittsburgh Medical School Department of Medicine and the Allergy Clinic of U. S. Veterans Hospital.

¹ Metzger, Edward. Bronchial Asthma Caused by Liver and Liver Extract Diet in a Patient Suffering from Pernicious Anemia. *J. A. M. A.* 96: 110 (Jan. 10) 1931.

² Held, I. W., and Goldbloom, A. A. Addi on Biermer's Anemia (Pernicious Anemia). Report of a Case Showing Allergic-like Phenomena to Liver Extract. *J. A. M. A.* 96: 1361-1363 (April 25) 1931.

³ Roovers, J. J. C. P. A. Treatment with Liver Extract (Liver-naemia). Unpleasant Symptoms After Injections. *Nederl. tijdschr. v. Geneesk.* 79: 5148-5149 (Nov. 2) 1935.

⁴ Engel, K. Anaphylactic Reactions in Liver Preparations. *Case of Pernicious Anemia.* *Bol. Asoc. med. de Puerto Rico* 25: 326-329 (May) 1933.

⁵ Lasch, Fritz. *Wien med. Wochenschr.* 86: 126-127 (Feb. 1) 1936.

⁶ Schlesinger, Wilhelm. A Case of Angioneurotic Edema from Oral Administration of Liver in Pernicious Anemia. *Wien med. Wochenschr.* 80: 696 (May 17) 1930.

⁷ Grun, G. Allergic Reaction to Injection of Liver. *Isa. all. u. Ortes. J.* 77: 736-738 (Aug. 19) 1933.

abdominal pain, from eating the skin of apples, the bulk of oranges, and cabbage. He presents no family history of allergy.

A diagnosis of pernicious anemia was made, and liver therapy by injection was instituted in February 1935. The patient received liver extract-Lilly intramuscularly at intervals of ten days for a period of one year without showing any untoward reaction. Clinical improvement was marked. Treatment was discontinued during April 1936 but resumed the first week in May. Shortly after the third injection in May 1936 a marked reaction developed consisting of severe asthma and generalized urticaria. This reaction lasted for from seven to twelve hours. In order to make certain that the reaction was due to the administration of liver, it was repeated the following week, with identical results. Intramuscular injections were therefore discontinued and autolyzed liver concentrate-Squibb by mouth was substituted. The patient showed no ill effects from this preparation, which he took for about six months. At this time, October 1936, it was discovered that he could again tolerate both the Lilly and the Parke, Davis & Co. liver extract by injection.

Physical examination was negative except for the presence of an enlarged spleen. Laboratory tests were negative except for the typical blood picture and reticulocyte response characteristic of pernicious anemia. Intradermal tests showed positive reactions to ragweed pollen and to several other allergens.

IMMUNOLOGIC STUDIES

A series of immunologic investigations were carried out on this patient at intervals of one, three and ten months following the initial allergic reaction.

A Intradermal Tests Made One Month After the Initial Allergic Reaction—1 Skin Sensitivity (table 1) Intradermal tests made with liver extract in May 1936 in various dilutions showed the presence of a high degree of skin sensitivity. Intradermal tests with buffered saline solution were negative. Control tests on six normal individuals with liver extract in stated dilutions (table 1) were negative.

2 Organ or Biologic Source Sensitivity (table 2) Liver extract-Lilly is prepared exclusively from swine. Liver extract-Parke, Davis & Co. is prepared chiefly from the same source.

TABLE 2—Intradermal Tests One Month After Reaction
Sensitivity to Organ or Biologic Source

Dilution 1:10	Coca Extract of Liver	Serum	Muscle Protein Extract	Six Normal Controls
Beef	Positive	Negative	Negative	Negative
Sheep	Positive	Negative	Negative	Negative
Chicken	Positive	Negative	Negative	Negative
Hog	Positive	Negative	Negative	Negative

TABLE 3—Tests One Month After Reaction
Transfer (Presence of Reagents)

Dilution 1:10	Dilution of 1:100		Coca Extract of Liver	Muscle Protein Extract	Serum	Control Glue
	Lilly	Parke Davis & Co.				
Beef			1:10 pos	Neg	Neg	Neg
Sheep			1:10 pos	Neg	Neg	Neg
Chicken			1:10 pos	Neg	Neg	Neg
Hog	Pos	Pos	1:10 pos	Neg	Neg	Neg

In view of the fact that the patient was sensitive to liver extract-Lilly, it was thought advisable to determine whether this sensitivity was one to liver as an organ or whether it was sensitivity to the biologic source. This is, an allergy to the animal from which the liver was obtained. Extracts of liver and extracts of muscle protein from beef, sheep, chicken, and hog were prepared according to Coca's method for the preparation of extracts used in intradermal testing. The patient yielded uniformly positive intradermal tests to 1:10 dilutions of all these extracts but negative reactions to the serums and to the extracts

of muscle protein of these animals (table 2). These results indicate, therefore, that at least in this instance acquired sensitivity to liver is sensitivity to an organ and not to a biologic source. The allergic reaction in this patient could not be avoided by changing to a commercial brand which uses a different source for its liver extract. In this respect the observations are analogous to those described by Tuft⁸ in the case of

TABLE 4—Intradermal Tests Three Months After Reaction

Dilution 1:10	Dilution of 1:1000		Coca Extract	Passive Transfer	Muscle Protein Extract	Serum
	Lilly	Parke Davis & Co.				
Beef			Pos	Pos	Neg	Neg
Sheep			Pos	Pos	Neg	Neg
Chicken			Pos	Pos	Neg	Neg
Hog	Pos	Pos	Pos	Pos	Neg	Neg

TABLE 5—Intradermal Tests Ten Months After Reaction
(Moich 1937)

Dilution 1:10	Dilution of 1:100		Coca Extract	Passive Transfer	Muscle Protein Extract	Serum
	Lilly	Parke Davis & Co.				
Beef			++	Neg	Neg	Neg
Sheep			Neg	Neg	Neg	Neg
Chicken			++	Neg	Neg	Neg
Hog	Pos	Pos	++	Neg	Neg	Neg

insulin sensitivity and those described by Simon and Ryder⁹ in the case of sensitivity to solution of posterior pituitary. While the patient could not be tested to the isolated antianemic principle in liver, it would seem that his sensitivity was probably to liver protein. This assumption was based on the fact that he showed strong skin reaction to 1:10 dilutions of extract of liver prepared for the purpose of skin testing and not for the purpose of concentration of antianemic principle.

3 Passive Transfer The presence of specific antibodies (reagents) was determined by the passive transfer test. A small amount of the patient's serum was transferred to several areas of the skin of four normal "substitutes." The injected or sensitized sites were tested intradermally with various dilutions of Lilly and Parke, Davis & Co. liver extracts. Other similarly sensitized sites were tested intradermally with 1:10 dilutions of extracts of liver of various animals, extracts prepared according to the method of Coca. Still other injected sites on the arms of the substitutes were tested with muscle protein extract and the serums of these animals. The results may be seen in table 3. Positive skin reactions were obtained in a dilution of 1:100 of the Lilly and the Parke, Davis & Co. liver extract. Positive reactions likewise resulted when liver allergen was used in a dilution of 1:10. Passive transfer was negative when the substitutes were tested with muscle protein extract or serum. The test was similarly negative when glue extract was used as a control. These observations, therefore, indicate that one month after the initial allergic reaction to liver the patient still had specific reagents circulating in his blood.

B Intradermal Tests Three Months After the Initial Allergic Reaction—Three months after the initial reaction to liver extract these investigations were repeated (table 4). The patient still gave positive skin reactions to liver extract in a dilution of 1:1000 and passive transfer tests were positive. These skin reactions were, however, less marked. It must be pointed out that autolyzed liver extract by mouth is tolerated well at this time. A possible explanation is the fact that autolysis destroys the native liver protein and its antigenic properties by splitting it far down to amino acids, proteoses and peptones.

⁸ Tuft, Louis. Insulin Hypersensitivity. *Am J M Sc* 176: 707 (Nov.) 1928.
⁹ Simon, F. A. and Ryder, C. F. Hypersensitivity to Pituitary Extracts. *J A M A* 106: 512 (Feb 15) 1936.

C Intradermal Tests Ten Months After the Initial Reaction (March 1937)—Ten months after the initial allergic reaction, the patient could tolerate injections of liver extract. Studies carried out at this time (table 5) still showed positive intradermal reactions to both Lilly and Parke, Davis & Co. liver extract although the reaction was less marked, only concentrations stronger than 1:100 yielding a positive result. Slight skin reactions were obtained with 1:10 dilutions of Coca liver extract of beef, chicken and hog but not with liver extract of sheep. The interesting present finding, however, is the negative passive transfer, indicating the absence of circulating reagins in the blood of the patient at a time when he seems to have lost his clinical sensitivity to liver.

D Presence of Associated Antibodies—According to Coca's view the reagins or specific antibodies produced in acquired allergy result from unusual exposure such as by injection to an unusual substance such as worms, insulin, solution of posterior pituitary and liver. Furthermore, in contrast to the reagins found in natural allergy (bronchial asthma, hay fever and the like) the reagins in acquired allergy are of short duration and their presence is usually associated with the finding of other antibodies, such as precipitins and anaphylactic antibodies. At the end of one and of three months following the initial allergic reaction in this patient his serum showed the presence of precipitins against liver extract when tested by the contact layer technic. Positive results were obtained with serum diluted up to 1:100. Control tests with normal serum to which liver extract was added were negative. Tests for precipitins were negative at the end of ten months following the initial reaction, that is, at a period when the patient was not clinically sensitive to liver and had no demonstrable reagins in his blood.

An effort was made to demonstrate the presence of anaphylactic antibodies to liver one month, three months and ten months following the initial reactions. The technic employed consisted in injecting four guinea pigs intraperitoneally with the patient's serum. From twenty-four to forty-eight hours later the animals received an intravenous injection of liver extract. In no instance, however, was it possible to demonstrate by this method the presence of anaphylactic antibodies. The Dale technic was not employed.

E Experimental Production of Allergy to Liver—Two atopic persons received liver extract-Lilly intramuscularly in 4 cc doses biweekly for four weeks. In addition, two other atopic persons received the extract intravenously in 4 cc doses twice a week for three months. None of these patients showed manifestations of sensitization. At the end of this period the skin was tested with liver extract-Lilly and with hog, cattle, sheep and chicken liver extracts and gave uniformly negative results.

A series of five patients with pernicious anemia receiving liver extracts by injection over a period of from one to three years was similarly tested intradermally, with uniformly negative results.

It appears, therefore, that some individuals regardless of whether they are naturally allergic or not, may acquire a sensitivity to such substances as liver when exposed to it by injection. This sensitivity is immunologically similar to that acquired by other persons to worms, insulin and solution of posterior pituitary. Exposure is essential for its production. Its existence is apparently dependent on the presence of reagins. But this type of sensitivity cannot be produced at will. Obviously some other factor in addition to exposure is essential, but what this factor is is still an unanswered question.

CONCLUSION

- 1 An instance of allergy to liver extract was observed.
- 2 The sensitivity thus produced is an acquired allergy and is analogous to that to insulin and to solution of posterior pituitary.
- 3 The sensitivity is one to an organ and not to a biologic source.
- 4 Positive skin tests and reagins are present for at least three months following the initial reaction.
- 5 Loss of clinical sensitivity is coincident with the disappearance of reagins.

- 6 Precipitins are demonstrable at the same time as reagins.
- 7 No anaphylactic bodies are demonstrable in the patient's serum.
- 8 This type of acquired allergy cannot be produced experimentally.

1001 May Building

STAPHYLOCOCCIC MENINGITIS

REPORT OF A CASE IN A SEVENTEEN DAY OLD INFANT SUCCESSFULLY TREATED WITH SULFANILAMIDE

HARRY BLOCH, M.D. AND B. L. PACELLA, M.D. BROOKLYN

Cases of meningitis due to staphylococci are uncommon. It is a rare occurrence in an infant under the age of 1 month. Josephine B. Neal¹ in her extensive experience has seen this type of meningitis in only two infants less than 1 year of age—one an infant 3 months old and the other 7 months old. The mortality in staphylococcic meningitis is appallingly high. There have been reports of recovery with staphylococcus autogenous vaccine and bacteriophage,² also following the use of gentian violet,³ and after frequent cisternal drainages.⁴

This case is reported as a rare instance of staphylococcic meningitis in an infant under the age of 1 month and because the patient responded to treatment with sulfanilamide.

REPORT OF CASE

A white baby boy, aged 17 days, was admitted to Kings County Hospital June 13, 1937. The mother stated that about thirty-six hours before admission she observed that the infant was irritable and refused its feedings. Several hours later there was a generalized convulsion, which recurred three times.

The mother's antepartum period had been uneventful. Labor was normal and spontaneous. A meningocele in the occipital region was removed when the infant was 6 days old. The postoperative period was uneventful. The baby was discharged from the hospital fourteen days after birth. The present illness had its onset two days later.

On admission, the infant's temperature was 98 F., its weight 3,500 Gm. It appeared undernourished, moderately dehydrated and apathetic. The neurologic examination did not reveal any abnormalities. On the lower part of the occiput, in the midline, the skin was drawn thin over a protrusion approximately 3 cm in diameter and 1 cm in height. The skin of the tumor was inflamed. A small thick scab covered the apex. The scab was removed and exposed a layer of thick pus. A smear showed many gram positive cocci in clusters. A spinal tap was done. Twenty cc of a cloudy fluid under slightly increased pressure was removed, and 10 cc of antimeningococcus serum was injected. The spinal fluid culture became negative on the eleventh day of treatment. Intrathecal sulfanilamide was given until the eighth day. The drug was given orally from the first day of treatment and for nineteen days after intrathecal medication was discontinued. A total of 158 grains (10 Gm) of sulfanilamide was given orally over a period of twenty-seven days. The infant's fever subsided on the ninth day of treatment.

COMMENT

The superficial skin infection of the meningocele subsided with dressings of warm boric acid solution. The infant's convalescence was essentially uneventful. General supportive measures such as parenteral fluids and transfusions were employed. There were no complications.

SUMMARY

A 17 day old infant with staphylococcic meningitis responded favorably to treatment with oral and intrathecal sulfanilamide. 1668 President Street

From the Pediatric Service, Kings County Hospital, Dr. George Brockway, chief.

- 1 Neal, Josephine B. Personal communication to the author.
2 Dunlap, J. E. Staphylococcic Meningitis with Recovery. *J. A. M. A.* 104:1594 (May 4) 1935. Stout, I. F. *Texas State J. Med.* 20:205-209 (July) 1933. Neal.¹
3 Blitz, R. J. and Hermann, E. *J. Med.* 17:247 (July) 1937.
4 Lamb, F. H. *Arch. Pediat.* 15:306 (May) 1928.
5 Jackson, R. J. *J. Pediat.* 11:518-521 (Oct.) 1937.

THE LARGEST SURGICALLY REMOVED HYPERTROPHIED PROSTATE

TORSTEN WADSTEIN M D LINKÖPING, SWEDEN

Recently Middleton¹ described a case of hypertrophied prostate of enormous weight, namely, 557 Gm. He considered this the largest one ever surgically removed. It may be of interest to readers of THE JOURNAL to hear about another man with this condition operated on in the Central Provincial Hospital in 1918. The enucleated prostate weighed 705 Gm and is the largest hypertrophied prostate ever surgically removed as well as the largest one on record in the world's literature.²

L A L, a farmer, aged 80, admitted to the hospital Sept 1, 1918, during the preceding twenty years had suffered from various urinary troubles and from time to time from acute urinary retention. During the past ten years he had catheterized himself three times a day, and occasionally slight bleeding resulted. The day before admission severe bleeding and dysuria had occurred.

At the time of admission to the hospital the patient was in rather good condition. The heart was normal. The lungs were somewhat emphysematous. Abdominal palpation revealed a tense bladder reaching to the umbilical plane. With a French Nelaton catheter the bladder was emptied. The catheter was left fixed. The combined abdominal and rectal palpation disclosed a large prostatic gland the upper rounded border of which was situated from 5 to 6 cm above the os pubis.

Eleven days later suprapubic enucleation was performed under parasacral anesthesia by the common technic employed by Dr Åkerblom: blunt forcing of the internal ureteral orifice by inserting the index finger, operation without the aid of sight, regular tamponade, suprapubic drainage, no irrigations, no postoperative probings. In this case the technic was modified because the huge gland had to be removed by morcellation. The bladder seemed to be a mere appendage to the gland. The enucleated pieces together weighed 705 Gm. Except for a remaining suprapubic fistula, which was closed later, recovery was perfect. At reexamination June 14, 1920, nearly two years after the operation, the patient was in excellent condition and presented no urinary difficulties whatever.

He died June 6, 1923, of senile marasmus. During the last three years he had not suffered from any urinary troubles.

Centrallasarettet

PRURITUS AND A SIMPLE AND EFFICIENT TREATMENT

HOWARD LILIENTHAL M D NEW YORK

The therapy of pruritus ani seems to have come into prominence during the past year. More and more the operative treatment has monopolized the literature. While I do not doubt that in some instances the formidable procedures which have been described may be advisable, yet the cases most frequent in general practice may easily be relieved or even cured by simpler means.

A method for which I do not claim originality but which I have employed for many years has been so frequently—almost uniformly—successful that it is my duty to describe it here. I will assume that a general examination of the patient has been made to rule out contributory disease such, for instance, as diabetes.

Scratching is a defense mechanism against pruritus, in these cases produced by "dirt." Minute cutaneous fissures, possibly caused originally by roughness in cleansing the parts after stool, are contaminated by fecal matter which is rubbed into them, and the consequent irritation and even slight infection produce the itching.

TREATMENT

The parts should be thoroughly cleansed with any of the non-inflammable grease solvents. Next the patient should hold the

buttocks apart so as to expose the region to the air until it is perfectly dry. It is usually unnecessary ever to repeat this first cleansing process. The next step is to fill the tiny fissures with some bland substance such as zinc oxide in the form of ointment. This need not be applied thickly but should be rubbed in so that the ointment may completely fill all the little superficial cracks. The patient is then instructed to apply a thick coating of zinc ointment before each evacuation. Ordinary cleansing with soft paper will then remove the feces, which will not have come in contact with the skin. After a few weeks of this treatment without the recurrence of pruritus, one may assume that healing has taken place, and the prevention of soiling the sensitive skin will avoid recurrence. For this purpose the use of the zinc ointment may be continued or, better, 25 per cent Burow's solution (solution of aluminum acetate) in a suitable ointment base. For convenience the ointment used should be provided in collapsible tubes. There is of course no objection to the occasional cleansing of the parts with soap and water so as to get rid of the ointment, say about once a week. I have had many years of experience with this form of treatment in numerous cases, with almost uniform success. Everything depends on the patient's intelligent cooperation.

52 East Eighty-Second Street

Special Article

STANDARD CLASSIFIED NOMENCLATURE OF DISEASE

The nomenclatures in use in the United States for recording information concerning morbidity vary from simple alphabetical lists of diseases to elaborate classifications. The resulting confusion and multiplicity of effort have been due to the absence of any central guiding influence. Until relatively recently, the terminology employed in each new nomenclature has represented a personal and individual choice.

The system of the Standard Classified Nomenclature of Disease is the result of an effort to remedy the existing confusion, initiated by invitation of the New York Academy of Medicine March 22, 1928, and the formation at that time of the National Conference on Nomenclature of Disease, with membership representing most of the leading medical and public health organizations in the country. In addition to the Commonwealth Fund, which largely supported the undertaking, much credit is due to Dr H B Logie, the executive secretary of the National Conference until the work was taken over by the American Medical Association. A number of individuals, special funds, insurance companies and medical organizations shared in the support of the conference.

The basic plan adopted officially at the second national conference on Nov 24, 1930, provided for a dual method of classification, based on topography (anatomic location) and etiology. The Standard Classified Nomenclature of Disease was prepared according to this plan and proposes to include every disease clinically recognizable. It aims also to avoid repetition and overlapping and to classify disease in a logical manner. Its size is somewhat greater than previous nomenclatures of disease only because it is more complete. An abstract for use by small institutions, however, has been found impracticable and unnecessary. English terms in good usage are employed whenever possible in preference to Latin and Greek terms, although numerous exceptions have been made, especially for diseases of the skin and eye.

From the surgical department of the Central Provincial Hospital
N Åkerblom M D director
1 Middleton R P How Large Is the Hypertrophic Prostate? J A
M A 109 1967 (June 5) 1937
2 Richter Solve Om s k transvesikal prostatectomi Uppsala Alm
qvist & Wiksell 1930

Eponyms are not used when an adequate descriptive title is available. The nomenclature also clarifies the distinction between a disease and its manifestations.

The nomenclature has been designed primarily for clinicians, since the clinical diagnosis is the source for all information on the prevalence and distribution of disease. With the realization that the nomenclature should be kept constantly abreast of the progress of medicine and occasionally subjected to necessary elaboration and revision, two editions have so far appeared and another conference and revision is contemplated for about 1940.

One of the great advantages of the Standard Classified Nomenclature of Disease is that the cards are so filed under the codes that they fall automatically into a clinical classification. If the codes are followed, diseases of the same organ fall together, while diseases of like etiology occupy corresponding positions under the heading for each organ.

The adoption of the complete Standard Classified Nomenclature of Disease need entail no additional burden on the record room of the small hospital. A new disease index requires at first only the main anatomic subdivisions. The diseases as they are reported are filed according to their anatomic sites and etiologic categories, thus the ultimate growth of a disease index file in a hospital record room will depend on the variety and volume of clinical experience and is no more difficult for the small hospital than for the large.¹

The classification is based simply on two primary factors: the portion of the body concerned (anatomic) and the cause of the disorder (etiologic). The first three numbers describe the anatomic site, the last three following the hyphen describe the etiology. It is, moreover, possible to indicate in the final diagnosis lack of knowledge of the exact part involved if this is the case, lack of knowledge of the cause of the disease, either because the cause is unknown or because it has not been determined in the individual case. In each case it is possible, therefore, to indicate the diagnosis as specifically as the combination of known factors and determined factors allow.

ANATOMIC CLASSIFICATION

There are twelve anatomic divisions

000- Body as a whole	500- Hemie and lymphatic systems
100- Integumentary system	600- Digestive system
including skin, mucous	700- Urogenital system
membrane and so on	800- Endocrine system
200- Bones, joints and muscles	900- Nervous system
300- Respiratory system	100- Organs of special sense
400- Cardiovascular system	100- Unknown part of body

These major groups may be further divided in order to specify a definite organ or part of an organ. Thus, for example, digestive system being 6, and the fourth organ in the system being stomach, the stomach becomes 64. The pylorus, which according to arrangement is the fifth structure under stomach, receives the code number 645. Thus if a lesion involves the whole digestive tract, it will receive the anatomic classification 600. If the disease involves all of the stomach, it will receive the number 640, and if it can be positively identified as involving the pylorus, it receives the number 645. If only partial diagnosis can be made and the lesion involves an unidentified portion of the digestive tract the anatomic code number will

be 6Y0. If it is in an unidentified portion of the stomach but not all of the stomach, it will receive the identification 64Y. In this manner all gradations of anatomic knowledge can be indicated by the anatomic code number.

ETIOLOGIC CLASSIFICATION

A similar system of numbering the causes of disease constitutes the second portion of the classification. Thirteen major classifications of etiology are included:

-000	Diseases due to prenatal influences
-100	Diseases due to lower plant and animal parasites
-200	Diseases due to higher plant and animal parasites
-300	Diseases due to intoxication
-400	Diseases due to trauma or physical agents
-500	Diseases due to circulatory disturbances
-500.5	Diseases due to disturbances or innervation or of psychic control
-600	Diseases due to or consisting of static mechanical abnormality
-700	Diseases due to disorders of metabolism, growth or nutrition
-800	New growths
-900	Diseases due to unknown or uncertain causes the structural reaction to which is manifest
-100	Diseases due to unknown or uncertain causes the functional reaction to which is alone manifest
-100	Diseases due to causes not determinable in the particular case

As in the anatomic classification, these major groups are further subdivided to specify particular etiologic agents. A causative agent identified as poison, but either of undetermined nature or unspecified, receives the number -300. If identified as metallic poisoning, but the exact metal undetermined, it will receive the number -310. If the metal can be identified as bismuth, it will receive the number -319, thus indicating the specific etiologic nature. In certain of the etiologic groups it is necessary to insert a fourth digit to indicate the anatomic or functional disturbance produced by the etiologic agent. If one wishes to indicate that bismuth poisoning has produced degeneration, the code number assigned will be -3199, the digit following the decimal point indicating the resultant degeneration. In certain instances a further unit is used without the decimal. For example, the code for gunshot wound is -414. If the wound is penetrating, it receives the code -4141, but if the wound is perforating it is -4142. The use of the fourth digit, therefore, allows an accurate diagnosis not only of etiology but also of its results.

If information for an accurate diagnosis is insufficient, that too can be indicated. Thus it is possible to code "undiagnosed disease of the heart." This would receive the anatomic designation for heart generally 410- and the etiologic diagnosis of -Y00, signifying an undiagnosed disease. The Y is used in all incomplete diagnoses, Y-Y therefore indicating complete ignorance of the disease.

SECONDARY DIAGNOSIS AND SYMPTOMS

Secondary diagnoses can be coded in a manner exactly similar to the primary. They may be placed either on the same card with a primary diagnosis or may be cross indexed with or without indication of the fact that they are of a secondary nature. Special secondary cards may also be used or merely colored inks or stars may serve to identify the primary from the secondary. For the indication of symptoms and syndromes, the Standard Classified Nomenclature includes code numbers for the nervous system, the heart and certain general manifestations of disease, for each of which special cards may be employed if desired. The latter are not to be used for diagnosis but may easily be separately kept or typed on other diagnosis cards.

¹ See also Legie, H. B. Making and Using Diagnostic Records—A New Method. Med. Rec. 12: 49 (April) 1934.

INSTALLATION

The installation of the system requires little expense or difficulty in addition to the purchase of the Standard Classified Nomenclature of Disease

If the hospital is using the vertical disease index it is merely necessary to obtain numerical guides for the new system, number the present diagnostic cards and file behind the guides. Such guides are available in any of the standard card sizes. If the hospital wishes to adopt a visible record system, it is necessary to obtain the desired cards which suit that hospital best and the trays. The visible system presents the advantages of allowing faster posting of case numbers on the cards and practically eliminates errors due to misfiling. The elaborateness of the cross reference cards should depend on the needs of the hospital.

Each card will ordinarily contain space for a large number of cases, hence after the original disease cards are numbered there is occasion to add new ones only when the old are filled or when some new disease is added to the record library. The index occupying the latter part of the book contains diagnostic terms in common usage so that the physician making the diagnosis can have ready reference from this section to the exact diagnostic term necessary for coding.

Council on Foods

THE COUNCIL ON FOODS HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS
FRANKLIN C. BING, Secretary

**C & H BRAND SUGAR PRODUCTS
NOT ELIGIBLE FOR LIST OF
ACCEPTED FOODS**

The California and Hawaiian Sugar Refining Corporation, Ltd., presented its C & H Brand Sugar Products, including various forms of refined cane sugar and brown sugar, for consideration for acceptance. Although the composition, method of manufacture and labeling of these products appear to conform to the requirements of the Council, the submitted advertising, particularly a booklet entitled "Something About Sugar," contains numerous objectionable nutritional claims. Among these are statements that sugar is "the greatest energy builder available to mankind", that it "supplies vim and vigor to the child and strength and energy to the grownup", that "the old belief that sugar affects the teeth has long since been disproven by scientists", that "sugar is among the foods least harmful to the teeth", that "overweight never has been and cannot be attributed to an increase of intake of sugar or any other single foodstuff," and that "the place of sugar in the human diet depends on the taste and inclination of each man, woman, and child. For practical purposes, the consumption of sugar lies outside of any discussion of nutrition."

The Council considers these claims false or misleading. Carbohydrates, including sugar, supply food energy; they do not build it. They do not "energize the body" or supply "vim and vigor" to either children or adults. It is generally agreed among experts in nutrition that sugar taken in excessive quantity is among the foods most detrimental to the teeth, although there is no general agreement on how it operates. Overweight in many persons has been and can well be attributed to an excessive intake of sugar. Sugar is a manufactured food which if properly used has a recognized place in the diet. It supplies calories and is classed by experts on dietetics as a desirable flavor food. However, the ingestion of excessive quantities of a chemically pure food such as sucrose interferes with nutrition to the extent that it cuts down on other food substances such as vitamins and minerals, which are associated with less highly refined products.

In November 1936 the firm was informed of the Council's objection to its advertising claims and was further informed that the products would be accepted on receipt of advertising suitably revised to meet the Council's objections. In reply the company wrote that the booklet "Something About Sugar" has been replaced by a new booklet "Behind Your Sugar Bowl." This booklet also contains unwarranted nutritional claims, similar to some of those found in the older advertising piece. Although informed of the unacceptable nature of some of the claims of the booklet "Behind Your Sugar Bowl" the company did not signify its intention to make them acceptable.

The Council voted, therefore, to declare C & H Brand Sugar Products ineligible for inclusion in the Council's list of accepted foods.

**BRAN-DE-NOG NOT ELIGIBLE FOR LIST
OF ACCEPTED FOODS**

Bran-De-Nog is a liquid mixture made from evaporated milk, egg yolk, cane sugar, grape brandy, alcohol, vanilla flavoring and glycerophosphates. It is distributed by the Bran-De-Nog Corporation, New York. In its advertising the firm has claimed that the product is a liquid health food prepared by a secret formula which was originated centuries ago among the primitive peoples of tropical Latin America. The label properly declares the alcohol content, which is 13 per cent by volume.

The Council cannot accept a product having the composition of Bran-De-Nog. The presence of 13 per cent alcohol in itself limits the usefulness of the product, in the opinion of the Council, to culinary uses as a flavoring agent or for various condimental purposes. The presence of glycerophosphates in an ordinary food product cannot be recognized if the purpose of the glycerophosphates is to justify the unwarranted claim that the product has a stimulating or tonic effect. The Council on Pharmacy and Chemistry many years ago reported that glycerophosphates have no special merit as a tonic and the Council on Foods is of the opinion that glycerophosphates have no special significance as a food for convalescents or for well persons.

Many of the claims made for Bran-De-Nog are exaggerated or unwarranted. The product is sold not only as a condiment, a class of products which is outside the scope of the Council's considerations, but also as a tonic "for young or old." The statement is made that "Children like it with milk," a great builder-upper." The food value of the product is stressed in an unwarranted manner. "Everyone knows the health value of eggs" but Bran-De-Nog has more vitamins per ounce and tastes better." The firm has presented no suitable evidence in support of these claims.

The Council therefore voted that Bran-De-Nog be declared ineligible for the list of accepted foods.

**FOODS SUITABLE FOR FORTIFICATION
WITH VITAMIN D**

The Council already has stated that, of all the common foods available, milk is most suitable as a carrier of vitamin D. This vitamin is concerned with the utilization of calcium and phosphorus, of which milk is an excellent source. At the time of publication of the report on the Present Status of Vitamin D Milk (THE JOURNAL, Jan 16, 1937, p 206) the decision was made that milk would be the only common food which would be considered for acceptance when fortified with vitamin D.

As a result of numerous inquiries, the Council has attempted to clarify the statement of its policy in the following manner.

It is the Council's intent in this instance to include under the term "milk" those milk products which are used in the same manner and for the same general purpose as milk. Thus would be included evaporated milk, dried milk, dried skimmed milk and flavored milk drinks prepared either from whole or from skimmed milk. This is not to be interpreted as suggesting approval of the fortification of milk drinks unless the volume of milk in the prepared drink is at least 80 per cent of the total volume. The Council, of course, requires that firms supply suitable evidence showing that the quality of the product and its vitamin D potency are being maintained.

THE JOURNAL OF THE
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SATURDAY, FEBRUARY 12, 1938

COUNTY MEDICAL SOCIETIES AND
MEDICAL SERVICE

Elsewhere in this issue (page 77B) appears an outline which represents the first step in the study of medical needs under the auspices of the county medical societies which constitute the American Medical Association This outline, prepared by the Bureau of Medical Economics of the American Medical Association, indicates the manner in which the study is to be made Through the Bureau of Medical Economics a series of forms will be made available in which the results of the study are to be collated These will then be forwarded to the headquarters of the American Medical Association for further analysis

The medical picture changes from time to time with changing economic conditions The situation in 1932, when the Committee on the Costs of Medical Care completed its studies, certainly differs from that in 1936-1937, when the United States Public Health Service made its survey of 750,000 families As the county medical society is the chief unit in each county concerned with the care of the indigent and those able to pay only a part of medical costs, the county medical societies have been urged to assume leadership in coordinating the work of health agencies, welfare agencies and similar bodies As soon as county medical societies become aware of the exact requirements, each may work out for itself the manner of meeting the needs The state medical society as the policy making unit will aid in determining the conditions under which service is to be administered In certain areas several county medical societies may find it necessary to unite in order to meet conditions which naturally group themselves as a problem for several counties

Obviously the next step will be the publication of information as to how the medical societies in this country are meeting the needs of their communities so that other counties similarly situated may take advantage of this experience It is hoped, through the Bureau of Medical Economics and through the office of the Secretary of the American Medical Association, to maintain these activities at a steady and progressive

pace By the prompt achievement of reasonable success in this nationwide coordinated effort the American medical profession may again demonstrate its willingness and its ability to provide the people of this country with the best possible medical service

THE DISTINGUISHED SERVICE MEDAL

In the House of Delegates of the American Medical Association during the Kansas City session in 1936, Dr Harrison H Shoulders of Tennessee submitted a resolution for the development of a plan whereby suitable recognition in the form of a medal or a testimonial might be given to Fellows of the Association who have rendered distinguished service in the science of medicine The committee appointed by the speaker of the House of Delegates recommended certain amendments to the By-Laws of the Association, which were adopted at the session in Atlantic City in 1937 In accordance with this action, a special committee, known as the Committee on Distinguished Service Awards of the American Medical Association, consisting of five members, was immediately established The first committee includes Drs H H Shoulders, Tennessee, J W Ames, Colorado, J D Brook, Michigan, J F Hassig, Kansas, and Grant C Madill, New York This committee is authorized to receive nominations for the award, which is to be given on the basis of meritorious service in the art and science of medicine The award is to include a distinguished service medal and a citation

One Fellow of the American Medical Association will be eligible to receive the award each year The nominations which come to the Committee on Distinguished Service Awards are considered by them and from these nominations five names are selected, which are submitted to the Board of Trustees The Board of Trustees, after its consideration of these five, selects not more than three, and these three are submitted in ballot to the House of Delegates by the Board of Trustees The House of Delegates then selects the recipient of the award from the list of nominees submitted by the Board of Trustees

The intricate method of selection has been planned definitely to eliminate any type of lobbying or pressure in the selection of the distinguished physician who is to be honored It is understood that the Board of Trustees will submit its first three candidates on a ballot to the House of Delegates at its first session on Monday morning, June 13, in San Francisco The medal will be awarded to the recipient at the open general meeting, at which the President is inaugurated and before which he delivers his address on Tuesday evening, June 14 In order to select a suitable recipient for the distinguished service medal and the citation for the session of 1938, it is desirable that those wishing to make nominations send at once to the Secretary of the American Medical Association,

Dr. Olin West, 535 North Dearborn Street, Chicago, the names of those whom they wish to place in nomination for this high honor, accompanied in each instance by the record of achievements of the person concerned

THE BUSINESS OF BIRTH CONTROL

In a survey of the business of birth control just published by *Fortune*,¹ the industry at present is said to be a \$250,000,000 a year business, with 57,000 outlets in drug stores and an estimated 243,000 other outlets of various and sundry kinds in every corner of the land. The total profit of the business to the manufacturers alone is estimated at \$75,000,000. It is a strange industry, with one foot among the sciences and reliable manufacturers and the other among hundreds of scoundrels who make small fortunes out of ignorance. Among its salesmen are bell-hops, elevator boys, street peddlers and even slot machines. And yet under the law it is theoretically impossible to sell contraceptives except for bona fide medical purposes.

As the writers in *Fortune* emphasize, the contraceptive manufacturer realizes that most of the products are unsatisfactory and frequently fail to produce the desired result. Recently the Federal Food and Drug Administration announced that, since such articles are sold for the prevention of venereal diseases, their standards of quality are subject to the same scrutiny as those of drugs. Already five states have forbidden by law the sale of appliances, drugs and medicinal preparations for the prevention of conception that do not conform to standards fixed by certain designated state agencies. The condom business is said to be a \$38,000,000 branch. Each of two pioneers in this branch of the business manufactures about 125,000,000 condoms a year. Quality tested condoms can be made for 1½ cents apiece and sold to the jobber for \$4.80 a gross, at 120 per cent profit. But what a step-up in price may druggists enjoy! Quality tested condoms sold by the jobber for \$6 are frequently sold retail by the druggist for \$24, a mark-up of 300 per cent. Druggists have sold for \$24 goods which they purchased for \$1.25, a mark-up of 1,820 per cent.

The feminine side of the birth control business is appalling. Women spend \$200,000,000 yearly for millions of devices, instruments, jellies, powders and liquids, totaling at least 636 different brands, sold largely under the deceptive advertising term "Feminine Hygiene." Not one of them has been proved to be entirely effective when used alone, and some of them are potentially dangerous. Physicians have asserted that not one of the products thus advertised cures or prevents venereal disease and that the normal female organs have no need for such hygiene. In fact, too frequent attempts at cleansing may even cause inflammation. Some of the numerous feminine products may not be harmful in themselves. Nevertheless they may

cause incalculable harm when advertised under a slogan that the public understands to mean contraception. "Feminine hygiene" products may even be advertised as "sure, safe and dependable," but where the advertiser means "sure, safe and dependable" for feminine hygiene the purchaser interprets it to mean sure, safe and dependable for contraception. Perhaps only physicians know that no "feminine hygiene" products are "sure, safe and dependable" contraceptives. The result of such advertising is that thousands of women are duped. There is not one product on the market that is 100 per cent efficient as a contraceptive measure.

As yet little scientific research has been done in the way of birth control. The need for research is obvious. At the annual meeting in Atlantic City last year the House of Delegates of the American Medical Association authorized the Council on Pharmacy and Chemistry and Council on Physical Therapy to "undertake the investigation of materials, devices and methods recommended or employed for the prevention of conception with a view to determining their physiologic, chemical and biologic properties and effects, and that the results of such investigation be published for the information of the medical profession." It is interesting that a publication like *Fortune* has made available complete information as to the manner in which commercial interests are exploiting the public in this field.

COLORADO CHIROPRACTORS MEET DEFEAT

On January 29 Secretary of State George E. Saunders of Colorado indicated that the initiative petition for an amendment to the Colorado constitution circulated by the chiropractors was invalid and insufficient for submission to the voters of the state at the approaching election. The petition, which had been developed by a group of Denver chiropractors, menaced the civil code of the state. The legislation proposed, if adopted, would have taken from the state legislature the right to regulate any profession by licensure or otherwise, it would have authorized each profession to license its own members and determine its own limitations. It would have invalidated the medical practice act and probably the laws relating to the practice of law, dentistry, nursing, optometry and other professions. It would have wrecked all other medical and public health laws of the state. It would have permitted unlicensed healers to practice in any hospital that received even the slightest tax support. They would, moreover, have been permitted to participate in workmen's compensation and other insurance practice. The decision of the Secretary of State is subject to review by the courts, but the facts and the logic on which the decision rests seem to be impregnable. There is every reason to believe that the decision will stand.

In the investigation of the methods employed in securing signatures to the initiative petition there developed proof of chicanery, misrepresentation and

¹ The Accident of Birth. *Fortune*. February 1938. p. 83.

fraud that make imperative hereafter the investigation of all initiative petitions with the same thoroughness that characterized the investigation just made by the Colorado State Medical Society. The petition presented to the Secretary of State contained more than 50,000 purported signatures. Apparently many copies of the petition had been circulated by or under the direction of a woman who was paid three cents for each signature she secured. She employed persons to circulate the petition, paying them two cents for each signature procured.

As reported in the decision of the Secretary of State many of the supposed solicitors of signatures could not be found at the addresses at which they were supposed to reside. Some of the signatures obtained were stricken from the petition by agreement of counsel for both parties because apparently written by other than the reported signers. The Secretary of State endeavored to procure the attendance as witnesses of 127 persons who had solicited signatures in Denver, but only seventeen appeared. Of 16,880 signatures purported to have been sworn to before the very woman primarily employed to obtain signatures, only 1,214 were found to comply with the law. From the evidence, the Secretary of State found it clear that those who obtained the signatures knew less than 1 per cent of the persons whose signatures they obtained, although they apparently were required to swear unqualifiedly that each signature was the signature of the person whose signature it purported to be. Certainly the Secretary of State was abundantly justified in the decision that he made.

The representatives of the Colorado State Medical Society who protested this petition are to be congratulated on the successful issue of their protest. The people of Colorado and of the entire country are to be congratulated on the outcome of the protest, which has shown so clearly dangers inherent in initiative and referendum measures. Clearly the hiring of persons to obtain signatures involves serious danger and should be carefully safeguarded. Every signature should certify, under penalty, that the signer has read the petition or had it read to him, that he fully understands it, and that he signs it of his own free will, without gift or consideration of any kind. In states in which the constitution and statutes that authorize initiatives and referendums do not now require such certificates, amendments should be proposed requiring such safeguards if initiatives and referendums are to continue in use. In any event, persons hired to obtain signatures should be carefully selected with due regard to their moral and other qualifications and solicitors should be punishable for any irregularities on their part. The initiative and referendum suitably used and controlled may be of service to democracy, but when exploited as was done by the chiropractors of Colorado in the present instance they may well constitute a menace to that system of government.

Current Comment

THE PNEUMONIA FILM "A NEW DAY"

Sponsored by the United States Public Health Service, the Metropolitan Life Insurance Company has developed a motion picture entitled "A New Day," which is now being shown by health departments and other agencies in many motion picture houses throughout the country. This picture promotes the cause of scientific medicine and teaches a few simple lessons regarding pneumonia. The film features Gilbert Emery, an actor who appeared to advantage in "The Magnificent Obsession" and also in "The Life of Emile Zola." The plot is simple: the mother ill with pneumonia, the father calling the family doctor, the taking of a specimen for typing, the correct diagnosis of the disease, the personal care by the physician, and the administration of specific serum. With this simple plot, the film nevertheless has strong emotional appeal and teaches perfectly for the public the importance of getting the family doctor as soon as possible, for the doctor, the importance of being certain of the diagnosis, the type of the organism, and the accessibility of the serum. The film was shown for a week in New York in the Radio City Music Hall, where it had an estimated audience of 121,000. More than three hundred additional bookings have already been scheduled in New York City and, with the aid of the various health departments, the film will also be shown in other places throughout the country. It has been endorsed by the Pneumonia Commission of the United States Public Health Service, the New York State Pneumonia Committee, the council of the New York State Medical Society and the New Jersey State Medical Society. Obviously this film is a valuable accessory in education of the public about pneumonia and in the campaign against this disease.

PUBLICITY FOR COOPERATIVES

The cooperative plan for medical service now being promoted under the title of Group Health Association, Inc., among employees of the Home Owners' Loan Corporation in Washington, D. C., is one of the strangest phenomena yet to appear on the medical scene. It has never been demonstrated that such a system, employing a few physicians full time for the medical care of thousands of people, can ever provide a quality of service even approximating in quality the kind of medical service that is today available for wage earners of the same class elsewhere in the country. Nevertheless, in a bulletin issued as a piece of publicity by the Bureau of Cooperative Medicine of the Cooperative League of the United States of America, it is said:

The Legislative Council of the United States Senate this week approved the allocation of \$40,000 by the Home Owners' Loan Corporation to assist the Group Health Association in a cooperative health unit for employees of the HOLC. The decision was made at the request of the House Appropriations Committee. After an investigation into the operations of the cooperative health association the council expressed the opinion that the sum was properly expended.

The House Appropriations Committee concurred in the decision but restricted further use of government funds for such purposes without special approval of Congress. Essentially agreeing that some form of cooperative medicine is essential, the Appropriations Committee report stated "Irrespective of the merits of the work proposed to be done the committee is of the opinion that such expenditures should not hereafter be made without express legal authority"

Now whenever you see a little group of dots like that which occurs in the propaganda of the Cooperative League it is well to get the original document and find what was left out. Here is the exact statement submitted by Mr. Woodrum, from the Committee on Appropriations of the House of Representatives

Entirely irrespective of the merits of the work proposed to be done under the Group Health Association, for which the Home Owners' Loan Corporation recently made a contribution of \$40,000, the committee is of the unanimous opinion that the expenditure was one not authorized by the law and that such expenditures should not hereafter be made without specific legal authority (Words omitted above are italicized—Ed)

It would pay every citizen to read the complete hearings on this question. In those hearings Mr. Dirksen inquired as to whether or not the next step would be for the government to set up grocery stores and meat markets for its employees and Mr. Woodrum asked "How about a good gymnasium down there or a beauty parlor or a barber shop?" And it should not surprise any one to hear that the representative of the Home Owners' Loan Corporation thought a gymnasium might well be within the functions of that body

FATAL NICOTINE POISONING

The United States Department of Commerce, Bureau of the Census, records 288 cases of fatal nicotine poisoning in the United States Registration Area for the years 1930-1934, inclusive. In Portland, Oregon, over a ten year period, according to Beeman and Hunter,¹ there have been twenty-two deaths directly attributable to the ingestion of nicotine insecticides. The report also states that nicotine ranks fourth among the different poisons responsible for accidental, homicidal and suicidal deaths over a ten year period ended in September 1936. The observations in eight necropsies are described. The essential lesions were of two types: those showing hemorrhagic gastritis, with or without the odor of nicotine, and often a brownish discoloration of the gastric mucosa, giving the picture of gastritis following the ingestion of a mild caustic, and those without gastritis but showing an acute failure of the right side of the heart without any exact anatomic basis for death. In those cases in which an adequate history was obtained, it seemed that collapse occurred shortly after ingestion of the poison, death being deferred for from five to thirty minutes. Convulsive phenomena and a typical posture, however, were conspicuously absent. In an attempt to determine the effects of nicotine and Black Leaf 40 (a common insecticide), guinea pigs were utilized. The animals receiving Black Leaf 40 exhibited a longer latent period before the

onset of the convulsions, and the convulsions were of lesser intensity than in those animals receiving 40 per cent nicotine alkaloid. All died with fixation of the respiratory muscles, the heart continuing to beat. A dilute solution of sodium hydroxide adjusted to the total alkalinity of the Black Leaf 40 sample failed to produce the same severe gastric changes. It was concluded as a result of these studies that, because of the violent toxic action and ready accessibility of nicotine, commercial preparations such as Black Leaf 40 should be subject to the statutes covering the sale of poisons and their sale by nonpharmaceutical dealers prohibited. Observations of this nature should be given careful consideration in the formulation of any new food and drug acts that may be adopted

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH)

ARKANSAS

Society News—At a meeting of the Southeast Arkansas Medical Society in Eudora November 15, Drs. George V. Lewis and John N. Compton, both of Little Rock, spoke on 'Tumors of the Breast' and 'Some Newer Remedies and Methods of Treatment' respectively.—Dr. Florian E. Schmidt, Chicago, addressed the Ouachita County Medical Society December 8 in Camden on 'Modern Treatment of Pneumonia'.—The Sebastian County Medical Society was addressed December 14 by Dr. Joseph H. Sanderlin, Little Rock, on 'The Climacteric'.—At a meeting of the Pope-Yell County Medical Society in Russellville November 25, A. B. Tate Jr., D.D.S., Russellville, spoke on 'The History of Dentistry' and Dr. George R. Siegel, Clarksville, 'Treatment of Disorders of the Endocrines'.

CALIFORNIA

Rinaldo in Court Thirteen Years—Pays Fine—Eugene J. Rinaldo, Los Angeles, paid in the municipal court of Los Angeles Dec. 14, 1937, a fine of \$500 imposed on him following his conviction by a jury in May 1937 of practicing medicine without a license. Judge Harold L. Landreth then suspended a sentence of 180 days in jail likewise imposed as a result of the jury trial and placed him on two years' probation. This action followed denial of Rinaldo's appeal from and denial of his petition for rehearing of the conviction. Rinaldo has been in the courts continuously for thirteen years. His license has been revoked twice, first in 1924 and again in 1932, on the charge that it was obtained under false and fraudulent credentials. In the testimony it was shown that Rinaldo's credentials purporting to be from the St. Louis College of Physicians and his certificate of preliminary education required by the California medical practice act were falsely and fraudulently obtained. After the revocation in 1924 Rinaldo appealed to the courts, which restored the license July 3, 1928. The board revoked the license again Oct. 18, 1932, and its action was affirmed by the courts in 1935. In the meantime, apparently, Rinaldo continued to practice and on this violation the board based the criminal action just ended.

COLORADO

Annual Registration Due Before March 1—Every person licensed to practice any form of the healing art in Colorado is required by law to register annually before March 1, with the secretary-treasurer of the Board of Medical Examiners, and to pay a fee of \$2, if a resident of Colorado or \$10, if a nonresident. Failure to pay this fee within the time stated automatically suspends the right of a licensee to practice while delinquent. If he nevertheless continues to practice, he is subject to the penalties provided by law for practicing medicine without a license. Failure to pay this fee for three consecutive years results in the automatic cancellation of a delinquent practitioner's license to practice.

¹ Beeman, J. A. and Hunter, W. C. Fatal Nicotine Poisoning. Arch. Path. 24: 481 (Oct.) 1937.

DISTRICT OF COLUMBIA

University News—Dr Edwards A Park, Baltimore, delivered the fourth lecture in the Smith-Reed-Russell series at the George Washington University School of Medicine, January 11, on "Bone Diseases in Children."

Sale of "Lash Lure" Prohibited—The sale, distribution and use of the hair dye "Lash Lure" in the District of Columbia has been prohibited, according to Dr George C Ruhland, health officer. The corporation counsel of the District in an opinion to the commissioners held that "Lash Lure" and similar dye preparations are subject to the control authorized under the act of Congress of 1898 relating to the District (Adulteration of Drugs Act of 1898) and therefore the sale of these dyes in the District can be prevented. An analysis of the sample in the District laboratory of 'Lash Lure' showed it to consist of paraphenylenediamine or a closely related compound and a small amount of magnesium carbonate.

FLORIDA

Personal—Dr Benjamin A Chapman, Jacksonville, has been appointed a member of the state board of medical examiners succeeding the late Dr John M Mann. Dr Julius C Davis, Quincy, has been reappointed a member of the board.—Dr Thomas Dwight Sloan, formerly superintendent of the New York Post-Graduate Medical School and Hospital, recently of Charlottesville, Va, has been appointed superintendent of the Flagler Hospital, St Augustine.

GEORGIA

Personal—Drs William T Asher, Charles E Boynton and Marion McHenry Hull were presented with certificates of honorary membership in the Fulton County Medical Society at its annual meeting in Atlanta January 6. Dr Asher has been a member of the society since 1894, and Dr Boynton and Dr Hull since 1900. Certificates recognizing twenty-five years' membership were presented to thirty-one members.

Society News—Dr Albert Worth Hobby, Atlanta, among others, addressed the Fulton County Medical Society January 20 on "Pneumoperitoneum as an Adjunct to the Treatment of Tuberculosis"—Herman A Shelanski, MA, Philadelphia, read a paper on "Trichomonas Vaginalis Vaginitis" before the Georgia Medical Society December 28, and Dr Maxwell Harbin, Cleveland, "Low Back Pain—Its Cause and Treatment"—At a meeting of the Decatur-Seminole Counties Medical Society in Bainbridge December 8 Dr Carl B Welch, Attapulgus, read a paper entitled "Government Control versus The Doctor," and Dr Mortimer A Ehrlich, Bainbridge, "Allergy."

The L C Fischer Awards—Dr Albert O Lynch received the L C Fischer Award of \$100 for the paper showing the most original work at the annual meeting of the Fulton County Medical Society in Atlanta, January 6. His subject was "The Treatment of Ingrowing Toenails." The prize for the best written paper was shared by Drs John D Martin Jr and Arthur Park McGinty. Dr Martin's subject was "Congenital Anomalies of the Midgut" and Dr McGinty's "The Comparative Effects of Pregnancy and Phrenic Nerve Interruption on the Diaphragm with Their Relation to Pulmonary Tuberculosis." Dr Lynch graduated at Emory University School of Medicine in 1925, Dr Martin in 1926 and Dr McGinty in 1932.

ILLINOIS

Society News—Dr George B Eusterman, Rochester, Minn, addressed the Sangamon County Medical Society in Springfield, January 6, on "Gastro-Intestinal Disorders: Important Advances in Diagnosis and Therapy."—A symposium on diseases of the heart was presented before the Macoupin County Medical Society in Carlinville January 25 by Drs Patrick B O'Connell Gillespie, Joseph J Grandone Gillespie, and Arthur D Wilson, Carrollton.—The Vermilion County Medical Society sponsored a medicolegal dinner in Danville January 4, sixty-eight physicians and lawyers from Illinois and Indiana attended.—At a meeting of the Champaign County Medical Society in Urbana January 13 Dr Frederick H Falk Chicago spoke on "Early Diagnosis of Carcinoma of the Uterus."

Chicago

The Bacon Lectures—Carl G Hartman PhD research associate department of embryology, Carnegie Institution and Johns Hopkins University School of Medicine, Baltimore will deliver the Charles Sumner Bacon Lectures at the University of Illinois College of Medicine, February 18-19. His

subjects will be "Physiology and Control of Menstruation and 'Physiology and Control of Ovulation'."

Psychiatric Work Increases—The psychiatric institute of the municipal court of Chicago handled more cases in 1937 than in any previous year since its establishment in 1914, 2,352 in 1937 against 2,183 in 1936. There were 701 patients certified to the psychopathic hospital as insane, of 117 persons adjudged feeble-minded, sixty-four were sent to the Lincoln state school and forty-nine to the Dixon state hospital and four to the Illinois Security Hospital. 314 patients were sent to the psychiatric clinics of the university medical schools. Dr David B Rotman is director of the clinic.

KANSAS

Cancer Day—January 21 was designated "cancer day" in Wichita. Members of the Sedgwick County Medical Society held a meeting with Mrs Marjorie B Illig New York, national commander of the Women's Field Army of the American Society for the Control of Cancer, to outline plans for an educational program.

Society News—The Marion County Medical Society was addressed December 15 by Drs Daniel V Conwell and Lloyd W Hatton, Halstead, on vertigo and pellagra as a local problem in Kansas, respectively.—At a meeting of the Shawnee County Medical Society in Topeka January 3 Drs Don C Wakeman spoke on "Differential Diagnosis of Jaundice", Leslie L Saylor, Use of Mecholyl in the Treatment of Varicose Conditions, and Norman Reider, "Convulsions as a New Treatment in Psychiatry." All were of Topeka.—The Southeast Kansas Medical Society was addressed in Chanute December 7, among others, by Dr Edgar A Pickens, Wichita, on "Resection of the Prostate"—Dr Henry G Hurtig, Hanover discussed focal infections before the Washington County Medical Society in Washington December 14.

MARYLAND

Personal—Dr Francis F Schwenker resigned as director of medical research in the Baltimore City Health Department January 1, to study scarlet fever in Rumania under the auspices of the Rockefeller Foundation. His headquarters will be in Jassy. Dr Schwenker is 33 years of age and a graduate of Johns Hopkins University School of Medicine, class of 1929.

Pneumonia Serum for Indigent Hospital Patients—Pneumonia serum in types available will be supplied to hospitals in Baltimore to treat indigent persons, according to *Baltimore Health News*. The board of estimates made this service possible with an appropriation of \$10,000. The distribution of the serum will be made on the basis of approved laboratory control for typing under the supervision of the bureau of laboratories of the health department. The consultants to the health department adopted a resolution in November recommending the appointment of a special committee to represent them to the health commissioner in matters pertaining to pneumonia control. Members of this committee include Drs Samuel Wolman, chairman, Wade Hampton Frost and Arthur J Lomas.

MASSACHUSETTS

The Cutter Lecture—Dr Andrija Stampar, formerly director of health of Yugoslavia and professor extraordinarius for social hygiene in Zagreb, Yugoslavia, will deliver the annual Cutter Lecture on preventive medicine at the Harvard Medical School, Boston February 15. His subject will be "Observations of a Rural Health Worker." Dr Stampar is also a member of the Secretariat of the League of Nations.

Society News—At a meeting of the Harvard Medical Society in Boston January 25 Drs Richard P Strong, Henry Pinkerton and David Weinman II spoke on "Medical Investigations in Peru in 1937"—Dr Donald S King discussed "The Development of Our Knowledge of the Lung and Its Diseases" January 17 at a meeting of the Boston Medical History Club.—The New England Society of Physical Medicine was addressed in Boston January 19 by Dr Franklin P Lowry Newton on "Some Fundamental Types of Physical Medicine and Their Practical Application"—At a meeting of the Norfolk District Medical Society January 25 Dr Louis E Planchet discussed "The Management of Uterine Prolapse"—The New England Heart Association was addressed January 24, among others by Drs Maurice A Schmitzer on "The Development of Fatal Lentic Aortitis Within Two Years After Primary Infection" and John A Boone and Samuel A Levine "The Prognosis of Potential Rheumatic Heart Disease and Rheumatic Mitral Insufficiency"—Dr Theodore Diller Pittsburgh, discussed "Human Credulity as Illustrated by Witch

craft" before the Boston Society of Psychiatry and Neurology January 20.—The Boston Society of Anesthetists was addressed January 25 by Dr Soma Weiss on "Peanesthetic and Postanesthetic Problems from the Point of View of the Internist"—At a meeting of the New England Pathological Society in Boston January 20 Dr Cornelius P Rhoads, New York, spoke on "The Pathologic Morphology and Physiology of Refractory Anemia"—Henry F Vaughan, Dr P H, health commissioner of Detroit, will be the principal speaker at the annual meeting of the Boston Tuberculosis Association at the Hotel Copley Plaza February 15

MICHIGAN

Hospital Survey in Detroit—Dr Jacob J Golub, director, Hospital for Joint Diseases, New York, will direct a hospital survey in Detroit to determine the need for a hospital under Jewish auspices in the city. The survey is being undertaken by the Jewish Welfare Federation of Detroit

Personal—Dr Joseph G Molner and Dr Franklin H Top will divide the responsibilities of the position of deputy health commissioner of Detroit, it is reported, succeeding Dr Don W Gudakunst, who recently resigned to become state health commissioner.—Dr Francis B Carroll, Paw Paw, has resigned as director of the Van Buren County Health Department to join the division of communicable diseases of the Massachusetts Department of Health, Boston, it is reported

The Hickey Lecture—Dr George W Holmes, clinical professor of roentgenology, Harvard University Medical School, Boston, will deliver the second annual Hickey Lecture in Detroit February 14. His subject will be "Hemoptysis and the Position of the Roentgen Examination and Its Diagnosis." The lecture was established in 1937 by the Detroit Roentgen Ray and Radium Society in honor of the late Dr Preston M Hickey professor of roentgenology, University of Michigan Medical School, Ann Arbor

All Cases of Syphilis Now Reportable—New rules and regulations of the state department of health, approved at a meeting of the state council of health Nov 11, 1937, require that all cases of syphilis be reported. The former regulations required only infectious cases to be reported. According to the state medical journal, physicians may report cases by name, initial or number. Health departments desire, however, that physicians avoid reporting by number if possible because of resulting duplication and lack of identification. These reports are confidential and the records are not public. They are to be made to local health officers in cities, counties and districts having full time health departments and to the state department of health in all cities and counties without full time health departments

MISSISSIPPI

Officers of State Board Reappointed—Dr James W Lipscomb, Columbus, was reelected president of the Mississippi State Board of Health at a recent meeting. Dr Leonidas B Austin, Rosedale, was reappointed as a member of the board, and Dr Felix J Underwood, Jackson, as executive officer

MISSOURI

Neuropsychiatric Meeting—The Missouri-Kansas Neuropsychiatric Association will hold its annual winter meeting in Kansas City February 15 at the Neurological Hospital during the day and the Jackson County Medical Society Auditorium in the evening. Demonstrations and discussions of metrazol and insulin shock treatments will be presented. The speakers will include

Dr Mabel G Masten, associate professor of neuropsychiatry, University of Wisconsin Medical School, Madison. Polyneuritis. A Metabolic Disorder

Dr Abram E Bennett, Omaha. Experiences with Convulsive Shock Therapy in Depressive Psychoses

Dr Edward G Billings, director, department of liaison psychiatry, Colorado General Hospital, Denver. The General Principles of Treatment in Psychiatry

Dr Walter Freeman, professor of neurology, George Washington University School of Medicine, Washington, D C, will address a joint meeting in the evening with the neighboring county medical societies on "Experiments in Prefrontal Lobotomy in the Treatment of Mental Disorders"

Society News—Dr William J Dieckmann, Chicago, discussed "Decreasing Cesarean Section Mortality" before the St Louis Medical Society December 14. Dr Edmund Jacobson, Chicago, addressed the society January 18 on "The Tense Patient in General Medical Practice." Following the lecture the society voted to make Dr Jacobson an honorary life mem-

ber—Dr John F Fulton, New Haven, Conn, discussed "The Contribution of the Anthropoid Apes to Clinical Neurology," December 17, at a meeting of the Kansas City Academy of Medicine.—The Kansas City Surgical Society was addressed December 15, among others, by Drs Harry C Lapp and David S Dann on "Multiple Diverticulitis of the Cecum" and "Radiation Treatment of Malignancy" respectively

NEW YORK

New Health Officials in Syracuse—Dr Henry Burton Doust, director of the bureau of tuberculosis in the Syracuse Department of Health, has been appointed commissioner of health to succeed Dr Gregory D Mahar. Dr Doust is also professor of clinical medicine in Syracuse University College of Medicine. Dr Robert D Johnson succeeded Dr Doust in the tuberculosis bureau and Dr Mahar at his own request returned to his former position as senior epidemiologist in the health department. Dr Edward J Wynkoop has been appointed head of a medical bureau in the city welfare department to have charge of city physicians

New York City

Fifth Harvey Society Lecture—Philip Bard, Ph D, professor of physiology and director of the department, Johns Hopkins University School of Medicine, Baltimore, will deliver the fifth Harvey Society Lecture of the current series at the New York Academy of Medicine, February 17. Dr Bard will speak on "Studies on the Cortical Representation of Somatic Sensibility." At the annual meeting of the society, January 28, Philip E Smith, Ph D, was elected president and Dr Herbert S Gasser, vice president. Dr McKen Cattell was reelected secretary

Alumni Program to Honor Dr Wyckoff—The annual Alumni Day of New York University College of Medicine, February 22, will feature a symposium on heart disease as a tribute to the late Dr John H Wyckoff, dean of the college at the time of his death June 1, 1937. Dr Alfred E Cohn will present a review of Dr Wyckoff's contribution to the study of heart disease and the symposium will be continued by Drs Donald Sheehan, Charles E Kossmann, Irving Graef, Isaac Seth Hirsch, Arthur C DeGraff, Currier McEwen, William Goldring and Clarence E de la Chapelle. There will be a luncheon at noon and Dr McEwen, dean of the college, will give an informal reception late in the afternoon

Progress in Control of Venereal Disease—The bureau of social hygiene of the New York City Department of Health recently issued a report on its work for the first nine months of 1937 showing the increase in its activities since the bureau was enlarged. There are now 119 clinic sessions held each week, in comparison with ninety-two at the end of 1936. Cases examined increased during the nine months over the corresponding periods of 1936 and 1935 by 18 and 87 per cent, respectively. Cases referred to health department clinics decreased by 4 per cent, to private physicians increased by 201 per cent and to private clinics increased by 85 per cent. Darkfield examinations increased by 85 per cent over 1936 and laboratory examinations by 25 per cent. About 50 per cent of lapsed cases investigated were returned to treatment

Afternoon Lectures on Obstetrics—The New York Academy of Medicine and the Medical Society of the County of New York are sponsoring a series of afternoon lectures on practical obstetrics in Hosack Hall at the Academy. The schedule is as follows

February 17. Dr Alfred C Beck. Prenatal Care and Differential Diagnosis of Pregnancy

February 24. Dr William W Herrick. The Diagnosis and Treatment of the Medical Complications of Pregnancy

March 3. Dr Samuel A Cosgrove. Jersey City, N J. The Diagnosis and Treatment of the Surgical Complications of Pregnancy

March 10. Dr Edward A Schumann. Philadelphia. The Conduct of Normal and Abnormal Labor, Including Consideration of Analgesics

March 17. Dr Harvey B Matthews. The Hemorrhages of Pregnancy

March 24. Dr Benjamin P Watson. Postpartum and Postabortion Septis

March 31. Dr George W Kosmak. The Postpartum Period

April 14. Dr Sam Z Levine. The New Born Infant

Personal—Dr John Hubley Schall was honored by a testimonial dinner given by the board of Prospect Heights Hospital, Brooklyn, December 8, on his retirement after serving thirty years on the staff.—Dr Charles J Imperatori, professor of clinical otolaryngology, New York Post-Graduate Medical School of Columbia University, was honored with a testimonial dinner January 20 at the Hotel St Moritz. Members of Dr Imperatori's teaching staff arranged the dinner and presented to him an oil portrait of himself.—Dr John Hamilton Crawford, assistant professor of pharmacology and

clinical professor of medicine Long Island College of Medicine, Brooklyn, has been appointed professor of clinical medicine and director of the Long Island College division at Kings County Hospital.—The Long Island Medical Society gave a testimonial dinner for Dr. Walter G. Frey January 27 in honor of his fiftieth anniversary of medical practice.

Society News—Drs. Foster Kennedy and Josephine B. Neal addressed the New York Neurological Society in a joint meeting with the section of neurology and psychiatry of the New York Academy of Medicine, January 11, on "Allergy and Its Effect on the Central Nervous System" and "Sulfanilamide in the Treatment of Acute Infections of the Central Nervous System" respectively.—Drs. Yale Kneeland Jr. and Jesse G. M. Bullowa addressed the Harlem Medical Association, January 5, on 'Common Colds and Influenza' and 'Time and Dose in Serum Therapy of Pneumococcal Pneumonias' respectively.—Dr. Frederick H. Verhoeff, Boston, addressed the section of ophthalmology of the New York Academy of Medicine January 17 on 'Anomalous Projection and Other Visual Phenomena Associated with Strabismus'.—Dr. Henry Rawle Geyelin delivered a lecture on 'Treatment of Diabetic Ketosis' under the auspices of the New York Diabetes Association at the New York Academy of Medicine, February 10, instead of Dr. Dana W. Atchley, as at first announced.

Academy Bulletin Expands—With the January issue the *Bulletin of the New York Academy of Medicine* adopted a new format and announced a new policy. The bulletin now appears in larger page size and new type. It is planned to publish more papers presented at the stated and section meetings, the annual graduate fortnight and the meetings of the affiliated societies. The editors invite reports of original research by members and fellows of the academy and others. Editorials will appear from time to time. "In short," says an editorial in the January issue, 'it is the intention to make the *Bulletin* a forum for discussion, on a high intellectual level, of matters having importance in the scientific and practical aspects of the life of medicine'. Dr. Mahlon Ashford, executive secretary of the academy's committee on medical education, is editor of the bulletin and secretary of a board of editors directing its publication. Other members of this board are Drs. Jerome P. Webster, chairman, Eugene F. Du Bois, Robert F. Loeb, Alfred E. Cohn, H. Burton Logie, Thomas Archibald Malloch and Karl Vogel.

NORTH CAROLINA

Hospital Opened—A new twenty-eight bed hospital for the treatment of tuberculosis was opened at Tarboro December 11, built by Edgecombe County with the assistance of PWA funds. Dr. Lorenzo L. Parks, health officer of the Edgecombe-Greene Health District, Tarboro, is medical director.

University Medical Society Organized—The Duke University Medical Society was organized in December to hold monthly meetings during the academic year for discussion of current problems and projects and to present occasional guest speakers. At the January meeting Ralph Walter G. Wyckoff, Ph.D., of the Rockefeller Institute for Medical Research, Princeton, N. J., was the guest speaker, on 'The Ultracentrifugal Study of Macromolecules'.

Graduate Lectures in Charlotte—A series of graduate lectures under the auspices of the University of North Carolina School of Medicine is being presented in Charlotte for fifteen counties. The schedule is as follows:

Drs. Oliver H. Perry, Pepper and Baldwin H. E. W. Lucke, Philadelphia, a clinicopathologic conference, January 11.
Dr. Roy R. Kricke, Emory University, Ga., anemia, January 18.
Dr. Russell L. Cecil, New York, pneumonia, January 25.
Dr. Jean P. Pratt, Detroit, endocrinology of the female pelvis, February 1.
Dr. Arthur M. Shipley, Baltimore, diagnosis of acute surgical conditions of the abdomen, February 8.
Dr. Walter C. Alvarez, Rochester, Minn., diagnosis and treatment of common diseases of the gastro-intestinal tract, March 1.

Personal—Dr. Samuel F. Ravenel, Greensboro, was honored by the Guilford County Medical Society at its annual banquet January 6 as the member who had accomplished most in the past year. Dr. James W. Tankersley, Greensboro, presided and Dr. Wilbur C. Davison, dean Duke University School of Medicine, Durham, was the principal speaker. Dr. Russell O. Lyday, Greensboro, president of the society, presented a silver plaque to Dr. Ravenel.—Dr. Loren Wallin, formerly of Sparta, Ga., has been appointed health officer of Anson County, a new health unit.—Dr. Clifford W. Lewis was recently elected president of the Beaufort Chamber of Commerce.—Dr. James H. Bunn, Jr., formerly of Henderson, has been appointed head of a new health unit in Johnston County, with headquarters in Smithfield.

OHIO

District Meeting—A meeting of the first district of the Ohio State Medical Association was held in Hamilton January 19 with the following speakers: Drs. Henry J. John, Cleveland, on diabetes; Walter M. Simpson, Dayton, artificial fever therapy; Albert Graeme Mitchell, Cincinnati, endocrine glands; Mont R. Reid, Cincinnati, wound healing; and Duncan M. Mason, Rochester, Minn., medical emergencies.

Society News—Dr. Walter John Urban, Massillon, addressed the Columbiana County Medical Society, Lisbon, January 11, on "Diagnosis and Treatment of the Commoner Psychoses".—Drs. William S. Wead, Sabina, and Leland H. Fullerton, New Vienna, addressed the Clinton County Medical Society, Wilmington, January 4, on diagnosis and treatment of syphilis.—Dr. Daniel J. Kindel, Cincinnati, addressed a joint meeting of the Miami and Shelby county medical societies in Piqua, January 7, on diagnosis and treatment of early syphilis.—Dr. William R. Cubbins, Chicago, addressed the Clark County Medical Society, Springfield, January 12, on fractures of the hip.—Dr. Edward H. Rynearson, Rochester, Minn., addressed the Summit County Medical Society, Akron, February 1, on "The Syndromes Resulting from Disturbances of the Endocrine Glands".

Free Course in Venereal Disease Control—A one week refresher course in venereal disease control is being offered at Western Reserve University, open to any regularly licensed physician in the state without fees. This is a shortening of the graduate course recently announced as planned to cover three or four months. The short course will consist of formal lectures on the several venereal diseases and demonstrations of methods of examination and treatment. Further information and a copy of the working schedule may be obtained from Dr. George W. Binkley, 2085 Adelbert Road S. E., Cleveland.

OREGON

Society News—Dr. Isidor C. Brill, Portland, addressed the Multnomah County Medical Society, Portland, January 19, on 'Coronary Artery Disease and Angina Pectoris'. Dr. Moses E. Steinberg, Portland, addressed the society, February 2, on "Surgical Treatment of Peptic Ulcer".—Dr. Leo S. Lucas, Portland, addressed the Central Willamette Medical Society, Eugene, December 2, on 'Injuries and Disabilities of the Shoulder Joint'.

PENNSYLVANIA

Conference of County Secretaries—The thirty first annual conference of secretaries and editors of component medical societies of the Medical Society of the State of Pennsylvania was held February 4 at Harrisburg. Separate sessions were held for the two groups in the morning with panel discussions based on suggestions submitted in advance by members. The remainder of the program was presented in joint session. Among the speakers were Dr. Paul Titus, Pittsburgh, on 'The Functions of the Special Examining Boards'; Dr. Calvin M. Smyth, Jr., Philadelphia, and Mr. David W. Ullman, chairman of the Pennsylvania Workmen's Compensation Board, on 'The 1937 Amendments to the Workmen's Compensation Act'.

Philadelphia

Retired Publisher Dies—Arthur H. Lea, for many years a partner in the publishing firm of Lea and Febiger, died in Chestnut Hill Hospital January 7, aged 79. Mr. Lea entered the publishing firm of his father immediately after his graduation from Harvard University in 1880.

Joint Surgical Meeting—The New York Surgical Society met with the Philadelphia Academy of Surgery, February 9 at the home of the College of Physicians of Philadelphia. After a group of case reports papers were presented by Drs. William O. Abbott and Isidor S. Ravdin on 'A Nonsurgical Method of Treating Localizing and Diagnosing the Nature of Obstructing Lesions of the Intestines' and by Dr. George P. Müller, on 'The Surgical Treatment of Peptic Ulcer'.

Society News—Dr. Julius Lempert, New York, addressed the Philadelphia Laryngological Society, February 1, on 'Endaural Surgery of the Temporal Bone'.—Dr. Harry Goldblatt, Cleveland, delivered the fortieth Mary Scott Newbold Lecture of the College of Physicians of Philadelphia, February 2, on 'The Pathogenesis of Hypertension'.—Dr. Norman I. Miller, Ann Arbor, Mich., addressed the Obstetrical Society of Philadelphia, February 3, on 'Cancer of the Cervix'. A consideration of certain problems associated with its control and cure.—Dr. Francis W. Smiler, was recently elected

president of the Aid Association of the Philadelphia County Medical Society and Dr Henry P Brown Jr, secretary—Dr John D McLean was elected president of the Medical Club of Philadelphia January 21 and Dr William S Wray, secretary—A symposium on pneumonia was presented before the Philadelphia County Medical Society, February 9, by Drs Lloyd D Felton, Baltimore, Hobart A Reimann and Leon H Collins Jr

Pittsburgh

The Bedford Lecture—Dr James D Heard, professor of medicine University of Pittsburgh School of Medicine, will deliver the Bedford Lecture for 1938 under the auspices of the Allegheny County Medical Society, February 23, at the Mellon Institute assembly room Dr Heard's subject will be "Galen Greco Roman Physician Whose Reputation for Infallibility was Unchallenged for Thirteen Hundred Years" The Bedford Lecture was established in 1922 by the College of Physicians of Pittsburgh In 1937 the sponsorship was transferred to the Allegheny County Medical Society together with the Bedford Lecture Fund, an endowment sufficient to finance the lecture for fifteen years The lecture is named in honor of Dr Nathaniel Bedford, who was surgeon at Fort Pitt, an incorporator of the Pittsburgh Academy, now the University of Pittsburgh, in 1787, and a trustee under the Penn Grant to Trinity Church

SOUTH CAROLINA

Annual Bennettsville Meeting—The annual meeting of the Marlboro County Medical Society and the Pee Dee Sixth District Medical Association was held in Bennettsville January 7 The speakers were Drs Joseph I Waring, Charleston, on "Nutritional Heart Disease", Thomas D Sparrow, Charlotte N C, "Surgical Aspects of the Duodenum", Wingate M Johnson, Winston-Salem, N C, "Influenza—Some Observations and Impressions," and Robert Wilson Jr, Charleston, "Clinical Manifestations of Dysfunctions of the Pituitary Gland" A motion picture on Complications of the Second Stage of Labor" by Dr Joseph B De Lee, Chicago, was shown Dr Douglas Jennings, Bennettsville, presided at a dinner at which the speakers were Drs Leonidas M Stokes, Walterboro, president of the South Carolina Medical Association, Edgar A Hines, Seneca, secretary of the state association, and Wingate M Johnson

TENNESSEE

Society News—Dr Frank E Whitacre, Memphis, clinician in charge of the graduate courses in obstetrics sponsored by the Tennessee State Medical Association, addressed the Dyer, Lake and Crockett Counties Medical Society, January 4, on "Fetal Birth Injuries"—Drs Worcester A Bryan, Nashville, and George C Williamson, Columbia addressed the Giles County Medical Society, Pulaski, December 23, on "Surgery of the Stomach" and "Some Surgical Conditions of the Abdomen in Infancy and Childhood" respectively—Dr Thomas B Sellers, New Orleans, addressed the Hamilton County Medical Society, Chattanooga, February 3, on "Non-surgical Treatment of Gynecological Conditions"—Dr William J Cameron, Sweetwater, addressed the Monroe County Medical Society December 17 on diseases of the kidneys—Dr Joseph Warren White, Greenville, S C, addressed the Sullivan Johnson Counties Medical Society, Bristol, February 2 on "Experiences with Epiphyseal Arrests"

VIRGINIA

Hospital Head Appointed—Dr Joseph R Blalock of the staff of the New York State Psychiatric Institute and Hospital has been appointed superintendent of the Southwestern State Hospital, Marion, to succeed Dr George A Wright, who resigned in December Dr Blalock is a native of North Carolina and graduated from Johns Hopkins University School of Medicine, Baltimore, in 1922 He has been associated with the New York Psychiatric Institute since 1929

Society News—At a meeting of the Southside Virginia Medical Association in Petersburg, December 14, the speakers were Drs James Morrison Hutcheson, Richmond, on "Prognosis in Coronary Thrombosis", Thomas W Murrell, Richmond, "Tropical Conditions as a Possibility of the Future in Virginia", Rudolph Angus Nichols Jr, Richmond, "Foreign Body Appendicitis" James W Hunter Jr, Norfolk, "Recent Kymography of the Heart," and George A Duncan Norfolk, "Sciatica"—Dr Maurice Barnes Woodhall, Durham N C addressed the Lynchburg Academy of Medicine December 6 on "Acute Head Injuries"

WEST VIRGINIA

Society News—Dr William S Middleton, Madison, Wis, addressed the Ohio County Medical Society, Wheeling, December 17, on "Postoperative Pulmonary Complications"—Dr Dean D Lewis, Baltimore, addressed the Monongalia County Medical Society, Morgantown, December 7 on "Glands of Internal Secretion"—Dr William C D McCuskey, Wheeling, addressed the Marshall County Medical Society, Moundsville, December 14, on diseases of the prostate gland

WISCONSIN

Outbreak of Trichinosis—Thirteen persons living near Waupun are reported to be suffering from trichinosis and a score of others are under observation after having eaten smoked pork sausage without cooking it Nine members of one family were in a hospital in Fond du Lac January 6, and several of their relatives and friends were later reported to have the disease The infected hogs were butchered on the Neitzel family's farm before Christmas and sausage was distributed to various persons in the vicinity

Society News—Dr Francis D Murphy, Milwaukee, addressed the Dodge County Medical Society, Mayville, December 2, on "Diagnosis and Treatment of Heart Failure"—Dr Robert E Burns, Madison, addressed the Outagamie County Medical Society, Appleton, December 2, on "Difficulties Encountered and Mistakes Made by General Practitioners in Treatment of Fractures"—Dr James B Carey, Minneapolis, addressed the La Crosse County Medical Society, La Crosse, December 7, on the use of the flexible gastroscope—Drs William F Moncreiff, Chicago, and Fred Z Havens, Rochester Minn, were guest speakers at a meeting of the Central Wisconsin Society of Ophthalmology and Otolaryngology at Fond du Lac in November Dr Moncreiff spoke on "Glaucoma, Modern Conception of Pathogenesis and Management" and "Cataract, Practical Points in Surgical Management" Dr Havens on "Infections of the Neck, Their Diagnosis and Treatment" and "Malignancies of Special Interest to the Otolaryngologist"

GENERAL

Memorial Cancer Fund—The American Society for the Control of Cancer has authorized the establishment of a special memorial fund of the Women's Field Army to receive contributions of men and women who have lost friends or relatives through cancer Seventy per cent of the money will be returned to any designated state division and 30 per cent will be retained by the national office for general educational work Each division may select its own project for support

Physicians' Art Exhibit—Entries for the first annual exhibition to be sponsored by the American Physicians' Art Association for the month of June in San Francisco will close April 1, it is announced The following classifications have been determined oils, water colors, sculpture, photography, pastels, etchings, crayon and pen and ink drawings (including cartoons), wood carvings and book bindings Scientific medical art work will not be accepted The exhibition is not limited to first showings Any physician interested should communicate at once with the secretary of the American Physicians' Art Association Dr Francis H Redewill, Suite 521-526 Flood Building, San Francisco

Tenth Year of Hebrew Medical Journal—The tenth anniversary issue of the *Hebrew Medical Journal* has recently appeared It contains articles in Hebrew with short English abstracts in a special section Contributors to the anniversary issue include Drs Solomon Solis-Cohen and Gershon Ginsburg, Philadelphia, David I Macht, Baltimore, Noah E Aronstam and Aaron Dubnov, Detroit, and Georg Arany, Karlsbad, Germany The journal also contains information on public health in Palestine, the Talmud and medicine, old Hebrew manuscripts, personal sketches of Jewish physicians and a glossary of Hebrew medical terms and their English equivalents The *Hebrew Medical Journal* was founded by a group of physicians in New York especially interested in the revival of the Hebrew tongue Dr Moses Einhorn, New York, is chairman of the advisory committee

Society News—At the winter meeting of the American Association for the Advancement of Science in Indianapolis recently Dr Thomas M Rivers, New York, was elected a vice president of the association and chairman of Section N the Medical Sciences—Paul F Clark PhD, professor of bacteriology, University of Wisconsin Medical School Madison, was elected president of the Society of American Bacteri-

ologists at the annual meeting in Washington, D. C. in December. Dr. Arthur T. Henrici, professor of bacteriology and immunology at the University of Minnesota Medical School, Minneapolis, was elected vice president, and Ira L. Baldwin, Ph.D., professor of agricultural bacteriology, University of Wisconsin, secretary. — Dr. Jose Arce, Buenos Aires, was elected president of the Pan American Medical Association at a meeting in Havana in the course of its annual cruise congress. The next congress will be held in Buenos Aires. — The fifteenth annual meeting of the American Orthopsychiatric Association will be held in Chicago, February 24-26, at the Stevens Hotel. Among the speakers will be Drs. Joseph C. Solomon, Baltimore, on "Active Play Therapy," George Stevenson, New York, "Training in Child Psychiatry," Franz G. Alexander, Chicago, "Culture and Personality," Margaret W. Gerard, Chicago, "Enuresis, A Study in Etiology," and Gregory Zilboorg, New York, "The Overestimation of Psychiatry and Psychoanalysis." At the annual dinner Friday evening Dr. George J. Mohr, Chicago, president of the association, will give his official address.

Memorial to William Alanson White—Funds are being sought by the William Alanson White Psychiatric Foundation to develop the Washington School of Psychiatry as a memorial to the late Dr. White. The school was provisionally organized in May 1936 by the foundation, an organization composed of former students of Dr. White. Some courses have already been held, but the school's development was delayed because of Dr. White's failing health and a lack of funds. The school is an outgrowth of the training committee of the Washington-Baltimore Psychoanalytic Society, which in 1933 began to sponsor a formal schedule of didactic lectures and seminars. Until adequate funds can be obtained, the nucleus of teaching activity in the school will remain with the training committee. The school is organized in three divisions: the biological sciences, Dr. Ernest E. Hadley, director and professor of human biology, the social sciences, Edward Sapir, Sc.D., New Haven, Conn., director and professor of anthropology, and psychobiology, Dr. Harry Stack Sullivan, New York, director and professor of psychiatry. Special courses devoted to the cultural background and the general field of psychiatry and the related sciences will be arranged for privileged groups on request and in keeping with the general policy of expansion. The headquarters of the foundation and the school are located at 1835 Eye Street N.W., Washington. Dr. Hadley is secretary of both. The foundation has announced the forthcoming publication of *Psychiatry, Journal of the Biological and the Pathology of Interpersonal Relations*. It is to be issued in February, May, August and November, each number to consist of about 150 pages. Dr. White, at the time of his death early in 1937, was superintendent of St. Elizabeth's Hospital and professor of psychiatry at George Washington University School of Medicine. He was honorary president of both the foundation and the school of psychiatry.

FOREIGN

Society News—Dr. James C. White, Boston, participated in a discussion of "Recent Advances in Surgery of the Sympathetic Nervous System" before the Medical Society of London January 24. Others who spoke were Sir Thomas Lewis, Prof. James R. Learmonth and Prof. Evelyn D. Telford.

International Congress of Surgery—The eleventh International Congress of Surgery will be held in Vienna September 19-22 under the presidency of Dr. Rudolph Matas, New Orleans. The subjects to be treated are surgical treatment of hypertension, bone grafts and surgical treatment of cysts and tumors of the lungs. Among the speakers listed on a preliminary announcement are Drs. Max M. Peet, Ann Arbor, Mich., Dallas B. Phemister, Chicago and Jose Arce, Buenos Aires, Argentina. For information address Dr. Leopold Mayer, 72 rue de la Loi, Bruxelles, general secretary of the congress.

CORRECTIONS

Lesions of the Brain Following Fever Therapy—In the article by Dr. F. W. Hartman, Detroit, with this title in *THE JOURNAL*, Dec. 25, 1937, the dose of pantopon in case 3, page 2116 should have read one-half gram (0.03 Gm.).

Atropine Sulfate—In the article by Dr. Abraham Myerson entitled *Human Autonomic Pharmacology* in *THE JOURNAL*, January 8, page 101, second column, twenty-third line, the phrase "Atropine sulfate (mandelic ester of tropine)" should read "Atropine sulfate (the sulfate of the tropic ester of tropine)." 1

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan 15, 1938

New Dust Respirator for Use in Industry

The Home Secretary has given notice that as the result of research work carried out by the Chemical Research Department, under arrangements made by the Department of Scientific and Industrial Research, a pattern of respirator has been devised which is considered suitable for use by workpeople in various dusty occupations, and a patent has been obtained. The government is prepared to consider applications from manufacturers of such appliances for facilities to manufacture the respirator. Application should be addressed to the Chief Inspector of Factories at the Home Office.

Forecast of Artificial Radium

Lord Rutherford's sudden death prevented his delivery of his presidential address to the Indian Science Congress at Calcutta, where it was read by Sir James Jeans. The part on the transmutation of the elements, in which he was the great pioneer, is of special interest to physicians. Lord Rutherford wrote that the discovery of the radioactivity of uranium and thorium, the two heaviest elements, was made in 1896. It soon was found that radioactivity was a sign that these elements were undergoing spontaneous transmutation. At any moment a small fraction broke up with explosive violence, hurling out either a charged atom of helium (an alpha particle) or a swift electron (a beta particle). As a result, a new radioactive element was formed. The problem arose whether artificial methods could be found to transmute the atoms of the ordinary elements. To attack it with any hope of success it was necessary to know more of the constitution of atoms. This was provided by the nuclear theory of atomic structure, which Lord Rutherford first suggested in 1911. He found in 1919 that nitrogen could be transformed by bombardment with fast alpha particles. Up to 1932, experiments on transmutation were confined to this method, but in 1931-1933 important discoveries were made—the discovery of the positive electron by Anderson in 1931, of the neutron by Chadwick in 1932, of artificial radioactivity by M. and Mme. Curie-Joliot in 1933 and of the transmutation of the elements by purely artificial methods by Cockcroft and Walton in 1932. The study of transmutation by accelerated protons and deuterons had given a wealth of new information. Bombardment of bismuth by fast deuterons produced a radioactive bismuth isotope, identical with the natural radioactive radium E. Many artificial radioactive elements could be produced. Thus bombardment of common salt by fast deuterons produced a radioactive isotope of sodium. This broke up with a half period of fifteen hours, emitting not only fast beta particles but gamma rays at least as penetrating as those of radium. It might well be that in course of time such artificial radioactive elements might prove a useful substitute for radium in therapeutic work.

Treatment of Endometriosis Followed by Pregnancy

At the North of England Obstetrical and Gynaecological Society, Prof. A. M. Claye reported the case of a woman, aged 30, married nine years, cycle 7/30, with normal l. s. She complained of dysmenorrhea for several years with recent exacerbation, sterility and internal dyspareunia. An indefinite mass was felt behind the uterus. Her husband recently had gonorrhea but there were no signs of this infection in the lower genital tract. A tentative diagnosis of endometriosis was made. At operation the left ovary was found enlarged and bound down by adhesions. When these were separated a cyst in the ovary burst and chocolate material exuded. This ovary was

removed. The right ovary was enlarged slightly and showed a few cysts. Wedge emincleation was performed and the ovary sutured. The appendix was removed.

Clinically this was a case of endometriosis, though the pathologist did not commit herself absolutely. The cyst was lined by pigmented granulation tissue, which is common in endometrial cysts. Good recovery followed. The dyspareunia and the dysmenorrhea were relieved. When last seen the patient was thirty-two weeks pregnant.

In his hospital records Professor Claye could find only two other examples of pregnancy following conservative operation for endometriosis, but as the cases have not been systematically followed up he thinks that pregnancy in such cases may not be so rare as he has supposed. One patient, aged 28, was married and had no children, but she had one miscarriage seventeen months before she came under observation. The main symptoms were pain in the right iliac fossa and dyspareunia. At operation some small fibroids were removed. The left ovary, which contained chocolate cysts, and the tube were removed. The right ovary was normal. The patient had a normal confinement just over a year later. The second patient, aged 26, had been married one year and did not have any children. She had suffered from dysmenorrhea ever since the menarche, but this was much worse in the previous six months, also she suffered from internal dyspareunia. Dilatation and curetting were done. There was endometriosis of the rectovaginal septum, which was confirmed on microscopic examination, and a small nodule at the back of the uterus. A small piece was excised for biopsy and the appendix removed. When last seen the patient was sixteen weeks pregnant.

Professor Claye has encountered endometriosis on cesarean section on three occasions, all the operations were done for placenta praevia. Burne and Williams state that nearly 50 per cent of patients with endometriosis are completely sterile, but the explanation is not clear. Claye suggests that there may be two causes: in some cases no doubt the fimbriated ends of the tubes are closed by adhesions, in others the dyspareunia militates against conception. He pleads that in cases in which endometriosis is not too advanced an attempt should be made at operation to leave some ovarian tissue so as to preserve the possibility of pregnancy. If the symptoms return they can be treated by means of x-rays. His impression is that the age period of the disease is put too high by most authorities. Bourne and Williams say 30 to 47 years, but Claye has had a good many patients under 30.

PARIS

(From Our Regular Correspondent)

Jan 15, 1938

Application in Hospitals of Forty Hour a Week Law

Reference was made in a recent letter to a paper read by Dr Georges Duhamel at the December 7 meeting of the Academie de medecine. At the December 21 meeting the director of the Assistance publique of Paris, Dr Mourier, replied to the criticisms of decreased efficiency as the result of the obligatory application of the forty hour a week law to the personnel of the public hospitals of Paris. The Assistance publique has 42,000 of the total number (in France) of 244,000 beds under its charge. Dr Mourier compared the period April 15 to November 15 in 1936, before the law was enforced, with a similar period in 1937. During the former there were 157,930 admissions and 11,879 deaths, as compared to the latter period, in which there were 158,610 with 11,763 deaths. As to the criticism that the sterilization of dressings could no longer be depended on, Dr Mourier stated that this was carried out in a central plant in each hospital and that control tubes were placed in each box so that the operating room nurses might readily find out whether the sterilization had been adequate. None of the surgeons had notified Dr Mourier of any infections in their services which could be ascribed to application

of the forty hour a week law. Furthermore, no complaint had been received that the operating rooms were available only three days a week as maintained by Dr Duhamel, instead of the customary six days. The nursing personnel had been devoted, no matter how much the new law had reduced their hours of service. Dr Mourier did not deny that there had been many difficult problems to solve in adapting the new law to public hospitals, but the same difficulty had been encountered twenty years ago when a law requiring hospital personnel to be on duty only eight hours a day was passed.

Dr Georges Duhamel in rebuttal repeated his charges that both in Paris and in the departments all over France many complaints had been received deploring the lack of adequate sterilization as the result of the effort on the part of hospital superintendents to comply with the forty hour a week law. The nursing personnel in some hospitals had done all in its power to make up for the lack of help by sacrificing the two free days a week to which they were entitled if the law had been followed. Many documents were submitted by Dr Duhamel to prove his assertions that the new law had created a chaotic condition not only in the majority of public hospitals but also in sanatoriums and asylums.

Choice of Operative Method in Thyroidectomy

At the December 15 meeting of the Academie de chirurgie of Paris a paper based on 1,261 thyroidectomies was read by Dr Henri Welti. Of these, 771 were for hyperthyroidism, 451 for nontoxic goiter, twenty-four for cancer, seven for chronic thyroiditis and nine for cardiac insufficiency or angina pectoris not due to toxic goiter. There were eight deaths, or a mortality of only 0.6 per cent. Seven of the eight postoperative deaths were due to thyrotoxicosis in patients with hyperthyroidism. From November 1936 to November 1937, 379 thyroidectomies were done without any deaths. The chances of recurrence are greatly minimized by removing as much as possible of the thyroid, i.e., a subtotal operation, only small areas on the posterior aspect of each lobe being left. Even under these conditions, hyperplasia has been observed in the remaining relatively minute portions. Thyroidectomy should never be too radical, because of risk of injury to the parathyroids and recurrent laryngeal nerve. Recurrence was noted in only 1.8 per cent of the subtotal operations. Although a mild degree of hypothyroidism was seen in a few cases, tetany was never observed.

Poor results following the subtotal operation were due first to the operation being performed at a time when irreparable cardiac changes have taken place and second to mistakes in diagnosis. Under the latter heading can be placed the cases in which the patients had a goiter and a relatively high basal metabolism. The cardiac symptoms were, however, not due to a thyrotoxicosis. Every effort has been made not to operate in these so-called false hyperthyroidism cases. Among the 451 patients in whom the operative indication was a nontoxic goiter there were forty-one in whom the goiter was substernal to a great extent. The mortality in these 451 cases was only 0.2 per cent. Of forty-seven patients with cancer of the thyroid, operation was considered justifiable in only twenty-four. There was no operative mortality. Curiotherapy was given in every case postoperatively. The diagnosis can usually be made before operation by the occurrence of recurrent laryngeal paralysis and during operation by the extremely vascular condition and difficulty in mobilizing the gland. A biopsy will clear up any doubt regarding the malignant changes.

Latent Benzene Intoxication

The steady increase in the number of industries that use benzene as a solvent has called for means by which an early diagnosis can be made of benzene intoxication. Dr P. Emile Weil and his associates read a paper at the December 21 meeting of the Academie de medecine of Paris in which they

reported the results of blood studies of fifty workers employed in the manufacture of rain-proof coats, in which group the majority of severe anemias following benzene intoxication are found. In more than half of the fifty workers, symptoms of latent character, such as fatigue, pallor and menstrual disturbances, were found. The blood examination revealed a moderate degree of anemia, especially in women workers. In addition to an average of less than 4,000,000 red blood cells per cubic millimeter, evidence of medullary aplasia was constantly noted in half of the fifty workers. There was also a marked leukopenia (less than 5,000 leukocytes per cubic millimeter), a decrease in the number of polymorphonuclear leukocytes (less than 55 per cent) and a moderate eosinophilia. In general, these blood changes were in direct relation to the length of time the worker had been exposed, but in several cases advanced blood changes were observed after only a few months of work. The anemia is more commonly observed in women workers. There is a distinct delay in the coagulation time. The severity of the anemia in benzene intoxication is the direct result of bone marrow aplasia. The chief preventive measure is to insist on adequate ventilation of all rooms in which the use of benzene is indispensable. The maximum number of hours should not exceed ten a day and all persons exposed to benzene intoxication should be compelled to submit to blood studies at regular intervals.

The Prevention of Measles

At the December 21 meeting of the Académie de médecine de Paris a report was submitted by Prof. André Lemerre, chairman of the Committee on Hygiene and Contagious Diseases, on the organization of centers for distributing serum from convalescent measles cases. In addition to three centers in Paris, there are twelve in other cities. The largest is at the Claude Bernard Hospital for Contagious Diseases in Paris, where the laboratory in charge of Dr. Jean Reilly has accumulated an average of from 10 to 12 liters every year since 1932. The center at Lyons distributed 4,000 cc during 1936, that of Strasbourg 1,585 cc and that of Bordeaux 865 cc. The difficulty encountered in obtaining convalescent serum has handicapped its more extensive use, but the results so far amply justify the establishment of centers on a larger scale. Measles predominantly affects infants and young children, so that it is possible to secure convalescent serum only from older children and adolescents, who are relatively rarely infected. It is difficult to conserve the convalescent serum very long because it loses its anti-infectious property rapidly. The most active serums are those which have been obtained recently. The objective of administration of convalescent serum is not to prevent measles, for which infection no vaccine has yet been discovered, but to decrease the virulence of the infection in those who have inadequate powers of resistance. The committee recommended continuation of the work of collecting convalescent serum as well as the creation of new centers.

Fernand Bezançon Elected President of Académie de Médecine

The internationally known phthisiologist Prof. Fernand Bezançon has been elected president of the Académie de médecine de Paris for 1938. This is a well merited recognition of the many contributions made by Professor Bezançon to the diagnosis and treatment of pulmonary tuberculosis.

Maurice Chevassu Elected President of Académie de Chirurgie

Prof. Maurice Chevassu, whose clinic at the Hôpital Cochin has been visited by many American urologists, was elected president of the Académie de chirurgie de Paris for 1938. Professor Chevassu will succeed Professor Marion as head of the urologic department of the Paris Medical School in the fall of 1938.

Summary at End of Articles to Be Made Obligatory

A committee was appointed early in 1937 by the Académie de médecine to study the question as to whether or not the author of every paper published in French medical journals should be compelled to add a summary. This committee submitted its report at the December 28 meeting of the society. The recommendations to be sent to the minister of public instruction were that a short summary should constitute a part of every article and that all publishers should require such a resume.

BERLIN

(From Our Regular Correspondent)

Dec. 20, 1937

Tonsillectomy in Cases of Rheumatism

In recent years the German literature has contained increasingly frequent reports of unsuccessful attempts to remove the foci of infection in rheumatic disorders. It is interesting to note the results of tonsillectomies performed on rheumatic patients at the Provincial Insurance Hospital of Silesia, Breslau. The data were contributed to the *Munchener medizinische Wochenschrift* by Dr. K. Stetter.

These figures, which include the patient's subjective evaluation of the result, offer an insight into the effectiveness of tonsillectomy, especially in relation to working capability. Of the persons questioned, 40.5 per cent are working steadily and without handicap. If to this number are added those persons who are working steadily but whose capability is diminished,

Postoperative Data on 331 Rheumatic Patients Who Underwent Tonsillectomies

	Number of Patients
<i>Working capacity</i>	
Completely and permanently fit	134
Permanently fit for limited work	71
Temporarily fit	58
Unfit	68
<i>Granted invalid compensation</i>	
For one year or less following treatment	21
For more than one year following treatment	19
Submitted to other therapeutic procedures	27
<i>Present status</i>	
Cured	35
Improved	169
Unchanged	42
Deteriorated	85
<i>Patient's opinion regarding tonsillectomy</i>	
Beneficial	230
No result	101
Followed by tendency to disturbances in the upper respiratory passages	26

the percentage of workers is 62.5. Only 20.5 per cent of persons questioned are absolutely unfit for work. Moreover, no appreciable changes were noted in the physical condition of the patients since the time of the intervention. Fewer incapacitated persons were observed among patients who had undergone tonsillectomies from five to seven years previously than among patients who had first been treated in more recent years.

The Breslau statistics become especially significant if one considers that in general only the more serious rheumatic disorders of long standing are treated at the Insurance Hospital, whereas in milder cases the patients are often treated, successfully, at home by the family doctor. The study also discloses that a large proportion of cases of acute, subacute and secondary chronic articular rheumatism were benefited by tonsillectomy, whereas of primary-chronic articular rheumatic cases only one third were benefited by the operation.

The operation disclosed severe defects in the tonsils of fifty-three patients; minor defects in the tonsils of thirty-four patients. Purulent foci were as a rule observed not so much in the hypertrophic type tonsil as in compact, scarred and shriveled tonsils which contained a purulent secretion and plugs. Pac

teriologic examination of the expressed secretion usually established the presence of *Streptococcus viridans* either alone or together with *Streptococcus haemolyticus* and the staphylococcus

Speedier Hospitalization of Tuberculosis Cases

The National Insurance Bureau in its capacity of supreme sickness insurance authority has issued new rules designed to expedite the hospitalization of tuberculosis cases. Two types of procedure are differentiated "speedy" measures and "immediate" measures. The former apply to all tuberculous patients who require hospitalization or some similar measure calculated to remove the peril of contagion to others. The necessary authorization for admission to a hospital can be quickly carried on, in some cases simply by telephone conversation. Immediate measures apply to the following forms of tuberculosis: (1) fresh, infiltrative forms of tuberculosis with or without breaking down of the tissues (even if the sputum tests for bacilli are negative), (2) tuberculosis with fresh, isolated cavity formation, (3) fresh, not too extended, dissemination forms, (4) active infectious cases which require hospitalization and in which the familial environmental conditions are bad. In this way periods of delay can be largely eliminated.

BELGIUM

(From Our Regular Correspondent)

Dec 18, 1937

Selection of Street Car Motormen

The driver of a public carrier bears a great responsibility. The men who are to function as drivers should therefore be selected with care. In a municipal laboratory at Liege, tests that aim at a better selection and supervision of public transport personnel are regularly carried on. The work of this laboratory possesses a twofold value: scientific and industrial.

1. The questionnaire and the medical history. Each candidate is first submitted to a rigorous questioning. The examining physician then fills in a medical record blank with data regarding the candidate's circulation, respiration, digestion, vision and hearing (with especial reference to the condition of the labyrinth). A motorman must be at least 1.6 meters in height, obese men are not hired. Much importance is attached to tests with the spirometer, as respiratory capacity is still the most reliable index of a subject's organic resistance. Ultimate decision as to the candidate's fitness is based on the sum total of data elicited.

2. Psychotechnical examination. A good motorman must be (a) sufficiently resistant to fatigue, this to be determined by means of the dynamograph, (b) promptly and properly reactive to signals observed under normal conditions, this faculty is ascertained by time tests of auditory reactivity, (c) possessed of ability to judge of speeds and distances, as demonstrated by the tachodometer test, (d) attentive to his work, that is, not readily distracted, this faculty is gaged by the diffused attention test. Motormen are variously classified on the basis of the different tests. To give an idea of the value of these examinations the somewhat disconcerting fact might be mentioned that, of 190 employees tested, eleven whose service records were good failed to pass, whereas seven who had been termed inefficient by their superiors received passing grades.

3. Follow up examinations. Since even the most perfect and healthy organisms undergo modifications in the course of the years follow up examinations should serve the interests both of the individual employee and of the personnel as a whole. Liege motormen under the age of 40 must submit quinquennially to a follow-up, after a man reaches 40 he is examined triennially. The results obtained in the psychotechnical laboratory have been most encouraging, since the laboratory's foundation there has been a notable decrease in the number of accidents in which street cars and motor busses are involved.

Diet of Native Workers in the Congo

Dr. Tollu has described the historical and technical background of the problem of a proper diet for native workers in the Belgian Congo. Since 1921 the vice governors of the four provinces of the colony at the request of the governor general have instituted legislation designed to implement the royal decree of June 15, which dealt with the hygiene and the safety of the native workers. Among other things these provincial ordinances take cognizance of the question of food rations for workers. Attempts to legislate in this regard gave rise to numerous controversies between various departments of government and the officials of industrial corporations. The resultant confusion led the government in 1927 to appoint a medical committee of investigation. This body submitted a resolution relative to a standardized dietary for the native worker. The standard ration for the man worker was fixed at 3,739 calories, that of the woman worker at 2,400 calories, for prepubescent children the ration was fixed at half the adult ration. In 1932 the governor general ordered the vice governors to determine the number of workers who received a food ration and to enforce the standardization of a suitable, healthful and plentiful dietary. Since that time each province has enacted new legislation and today important differences exist between the laws of the four provinces. The author lists the principal types of food provided by different organizations (mining companies, oil companies, railways) within the various provinces.

The author concedes that the problem of feeding the black worker as it confronts these corporations is complex. The Mining Association of Upper Katanga has hit on a satisfactory way out which, however, is not feasible for the rest of the country. It is recommended that the standardized ration as defined by the governor general should be adopted throughout the colony. The vice governors should confine their duties to an enforcement of this standard. The nutrient values of various foods is established by chemical analysis, therefore each province should possess the necessary dietetic laboratories as well as a technical dietary staff, which latter would be commissioned to study the dietary of the native in his ancestral environment and the regimens most suitable for the workers of various classes, agricultural, industrial, mining and so on. Finally, in case the worker receives money in lieu of a food ration, it is of the utmost importance that the blacks should be instructed in the rudiments of dietetics. Otherwise they will revert to the faulty eating habits of their ancestors and this would spell the rapid onset of malnutrition and racial deterioration.

ITALY

(From Our Regular Correspondent)

Dec 30, 1937

Congress of Internal Medicine

The Italian Society of Internal Medicine held its forty-third national convention at Turin. Senator Prof. Edoardo Maragliano presided.

The first topic for discussion was colitis. The principal speaker was Professor Ferrata of Pavia, assisted by Professors Pellegrini, Fieschi and Beltrametti. Ferrata stressed the vastness of the topic. His observations were largely based on clinical experience. He feels that caution should govern the diagnosis of colitis. He considers unjustified the all too prevalent concept of colitis as a disorder which usually runs a chronic course and is difficult to arrest. The author believes that in many cases with rather obvious clinical symptoms and seemingly corroborative radiologic data the disorder may not be true colitis but an ailment of the colon the pathogenesis of which must be looked for in some other region. Precise limitation of colitis offers a peculiar difficulty, since the colon is not a well defined organic entity, as regards either morphology or function. The colon is host to a varied bacterial flora, which participate in both normal and pathologic digestive functions.

The colonic mucosa, being both excretory and secretory, represents a wide surface of resorption and the richness of glandular activity makes for a ready secretion of mucus, which, wrongly perhaps, may be regarded as undoubted evidence of true colitis.

Pellegrini discussed the dysfunctional and lesional colonopathies that appear as secondary manifestations of extracolonic disease. There exists a close interrelation of these colonopathies and the functional conditions which link the colon with other parts of the alimentary tract and with other abdominal viscera. The neuromuscular activities of the colon are subject to the modifications of digestive function, alteration of the chemistry of alimentation can lead to resorption of toxic substances and to release of toxins. Various agencies, such as parasitic infestation, stasis or diarrhea, may induce traumatic injuries and neuromuscular dysfunctions within the colon. Phenomena of sensitization are easily elicited.

Friesch discussed the interrelation of chronic appendicitis and colonopathy. The most common myodynamic reflex is colonic spasm, which, although it does not seriously inhibit peristalsis, may result, because of the colon's irritability, in disturbances of motility and inefficient bowel movements. Then, too, influences which render the colon hyposensitive, for example, a disturbance in Auerbach's plexus, can profoundly disorganize colonic motion. Appendicitis with colonic manifestations may exacerbate certain neurovegetative tendencies in persons who present vagotonic orientation or sympathetic hypotonia. Dysfunctional disturbances may be followed by mucous colitis. The latter condition can as well be based on generalized neurohumoral factors as on ileocecal dysfunction. Disorders that involve both the appendix and the colon may also be complicated by deeper lesions which involve the colonic wall in its entire surface and breadth. Such complications mean a genuine colitis, which runs a more obviously autonomous course. An important clinical sign is chronic constipation in rectosigmoid stasis, its commonest topographic form. Possible influence of the colonic lesions on the appendix should not be overlooked. Any therapeutic approach to cases of essentially functional colitis concerns itself first of all with an attempt to reestablish normal digestive function and to correct the sympathetic nervous atony that accompanies the disease. The psychic condition should be carefully observed, especially in female patients. The question of operation in cases of appendicitis complicated by colitis should be decided on the merits of each case. The more severe the inflammatory lesions, both visceral and perivisceral, the greater the caution to be exercised with regard to surgical intervention.

Beltrametti mentioned the etiology and pathogenesis of non-amebic ulcerative colitis and of colonic ulcers. Most authors assume that an infection is the essential etiologic factor in ulcerative colitis. This condition is not attended by well defined clinical symptoms nor does it assume a characteristic anatomic form, since the initial lesion cannot be differentiated from that of other colonic disorders, both specific (bacillary dysentery) and nonspecific (ulcerations having a toxic, vascular or dyscrasic origin). Relatively easy is the differential diagnosis of colonic ulceration when the latter is based on tuberculosis or syphilis, since the lesions are accompanied by unequivocal structural and histologic alterations. In 1924 Bergen isolated a gram-positive diplostreptococcus which, when injected intravenously into rabbits, produced an experimental syndrome similar in many respects to ulcerative colitis in man. However, Bergen's concept of specificity has been strongly opposed. Swartz advances an enterococcal basis of ulcerative colitis. Surmont and Buttaux, who favor the theory of a multiple infective pathogenesis, attach particular importance to *Bacterium morganii*, one of the *Salmonella*. The author considers most tenable the hypothesis of a specific virus, as advanced by Gallart, Mones and Domingo.

The second theme of discussion was the physiopathology and special pathology of senescence. The speakers were Professors

Bastai and Dogliotti, both of Florence. They cited as among the more prominent morphologic characteristics of senescence atrophy of the more important parenchymal elements, excessive deposits of waste products in the protoplasm and in the intercellular spaces, and alterations in the connective tissues. Among important functional changes the authors mentioned diminished tonus and functional rhythm of various organs and systems; these dysfunctions may be manifested constantly, even while the person is in repose, or may be of a latent character and manifested only on exertion. The processes of rehabilitation are retarded and the tendency to hyperfunction and hypertrophy is diminished. Senescence is characterized by numerous habitrophic and degenerative disorders and this fact imparts to all ailments of old age a peculiar significance. In senescence one assumes the presence of generalized alterations relating to all organs and systems. But these changes are not necessarily radical enough to effect a speedy destruction of protoplasmic vitality. The encroachments of age meet with greater resistance in those organs which function to regulate and control, above all in the sympathetic nervous system and the endocrine system. So formidable is this resistance that observers have been led to doubt the existence of separate processes of involution in these systems and it is even maintained that some of the endocrines, such as the thyroid, adrenals and hypophysis, undergo in senescence a phase of hyperactivity. The authors interpret the complexity of senile alterations in terms of a fundamental physiopathologic factor, capillary involution, by which they mean not only the reduction of the capillary layers and the diminution of capillary elasticity, adaptability and permeability but the diminution of the intercellular spaces and of the body serums. These restrictions of capillary function tend eventually to destroy the vitality of the protoplasm. According to the authors the concept of a capillary involutional basis of senescence has received widespread confirmation; numerous direct proofs have been adduced which demonstrate the presence of various constant and profound changes in the marvelously intricate network of the small vessels.

In the latter half of their report, the authors discussed classification and description of senile disorders on the basis of physiopathologic data and clinical observations. A first group, still being worked out, comprises all disturbances the exclusive cause of which is a relative exaggeration of the senile processes. To this group belong various diseases of the vascular and respiratory systems and of the abdominal viscera, besides senile dementia. In a second group the authors include a large number of disorders which they subdivide as follows: (1) diseases which, although common in old persons, are not in a strict sense based on senescence, (2) disorders of obscure pathogenesis, (3) diseases in which a state of senility is always a complicating factor but is not the direct and exclusive pathogenic factor and (4) cases in which certain elements of the anatomic and clinical picture are entirely unrelated to the more prominent characteristics of senescence. Among the many disorders included in this second classification are arteriosclerosis, prostatic hypertrophy and senile osteoarthropathy. In a third group the authors place those common ailments of adult life which in old age assume an extremely disparate clinical appearance and course. This group comprises many types of infection, cardiac decompensation and diseases of the stomach and kidneys. The authors' aim has been to place various diseases in their proper physiopathologic relation to senescence and to provide a broad outline of the characteristics of senescence.

Muscular Dystrophy

Professors Bosche and Campailla in a lecture delivered to the Accademia delle Scienze Mediche of Ferrara reported their results from the administration of Meldonis in treatment of progressive muscular dystrophy. It is believed that the condition originates in alterations of the sympathetic centers which regulate the metabolism of the muscles, as well as in functional

disorders of the pancreas which result in increasing the catabolic processes of the muscles. The treatment of the condition is one of substitution, which aims to stimulate the function of the pancreas.

Death of Dr Simmons

Many Italian journals carried obituaries of Dr George H Simmons. Tribute was paid to the work accomplished by him during his twenty-five year editorship of THE JOURNAL and messages of condolence were offered.

BUENOS AIRES

(From Our Regular Correspondent)

Dec 30, 1937

Professor Sergeant Honored

Prof Emile Sergeant of the Faculty of Medicine of Paris came to Buenos Aires on invitation of the Asociacion Medica Argentina to lecture. He gave twenty-eight lectures with great success. As he reached the age limit for teaching, ceremonies were held, during which Drs Jose Arce, B A Houssay and C Mamm spoke in representation of the Facultad de Medicina, Academia de Medicina and Asociacion Medica Argentina. He was presented with a bronze plate.

In Honor of Harvard University

The Instituto Cultural Argentino Norteamericano organized a reunion, which took place October 26 in honor of the third centennial of activities of Harvard University. A talking film of the ceremonies of the third centennial at Harvard, which was lent by the university, was run during the reunion. Prof B A Houssay lectured on the significance of the film in connection with the celebration.

Congresses in Buenos Aires

The ninth Congreso Argentino de Cirugia was held at Buenos Aires October 10-16. There were Professors Navarro of Montevideo, Vargas Salcedo of Santiago, Chile, with a group of seventeen surgeons from Chile, Masi of Paraguay, Monteiro of Rio de Janeiro and Benedicto Montenegro of São Paulo with a group of Brazilian surgeons. The topics discussed were liver insufficiency in surgery of the liver by Dr Oswaldo F Mazzini, treatment of duodenal ulcer by Drs Benedicto Montenegro and O Gomez, and trauma of the vertebral column by Drs M Fitte and A F Camauer.

The Congreso Argentino de Obstetricia y Ginecologia met in Buenos Aires, October 18-24. Professors Pouey, Turenne and Infanzozzi of Uruguay, A Monteiro of Brazil, Garcia Valenzuela y Vargas of Chile and A Dronet of Ecuador were present. Official topics and speakers were the following: Obstetric Surgery in Infected Cases, Profs Carlos Monckeberg of Chile and D Rojas of Buenos Aires, Actual Value of Forceps, Profs J Infanzozzi of Montevideo and J C Llames Massim of Buenos Aires, Puberty and Menopause, Prof A de Moraes of Rio de Janeiro, Sterility and Its Treatment, Profs A Cavaglia and D Colillas of Buenos Aires.

The second congress of the Confederacion Americana de Urologia took place in Buenos Aires November 28-December 4 under the chairmanship of Prof Bernardino Maramba. Official topics and speakers were the following: Hidatidosis of the Genito Urinary Tract, Profs L A Surrao of Montevideo and R Spurr of Buenos Aires, Tuberculosis of the Genitals, Profs L Diaz Muñoz of Chile and L Figueroa Alcorta of Buenos Aires, Urography, Profs William F Braasch of the United States and J Salleras of Buenos Aires, Endoscopic Surgery of Adenoma and of the Prostate, Profs A Gucreiro de Faria of Rio de Janeiro and Arturo Serantes of Buenos Aires.

Deaths

Prof Pedro Chutro, a teacher of clinical surgery of the Faculty of Medicine of Buenos Aires, died, aged 57. During the World War he was the head of the Hospital du Lyce Buffon.

Ceremonies were held in his honor by the members of the Academia Nacional de Medicina, the Faculty of Medicine of Buenos Aires and the groups of physicians of the Ramos Mejia and Alvarez hospitals.

Prof Eduardo L Holmberg, who was an honorary member of the National Academies of Sciences and Medicine, died recently, aged 85.

Prof E Hassler, an Argentine physician from Switzerland and honorary member of the Academia de Medicina of Buenos Aires, died recently, aged 83. He was the head physician to Presidents Sarmiento and Alvear.

Prof Luis Guglielmelli, an instructor of chemistry at the Facultad de Ciencias Medicas of Buenos Aires, died recently. He made special studies of fluorine and diphenyl.

BUDAPEST

(From Our Regular Correspondent)

Jan 8, 1938

Memorial to Sigmund Purjesz

The scientific activity of Prof Sigmund Purjesz, who taught clinical medicine at Budapest University at the end of the last century, is well known. His fight against the cholera epidemic in Hungary in the nineties saved western Europe from this scourge. In a memorial address, Janos Angyan, professor at Pecs University, emphasized that Purjesz always took great care to increase the trust of the public in the medical sciences and in his large practice he never failed to stress the trust between patients and their attending physicians. In this age of social changes, it is my conviction, said Professor Angyan, that we must not surrender, rather we have to increase, the spirit of trust between patient and physician, which spirit was proclaimed by Purjesz.

The Koranyi School in New Quarters

Prof Baron Alexander Koranyi, the well known clinician, having reached the age limit, has had to retire from his professorial chair. His entire clinic has been dissolved. In order that his school may carry on, voluntary contributors have provided a well equipped sanatorium, the staff of which consists of the personnel of the former clinic, in this way the scientific activity of the Koranyi school is being continued.

Service by Medical Students

It has long been a desire of medical students to act, during summer vacation, as assistants to physicians in public hospitals or with district physicians in villages, thus making themselves acquainted with the details of medical practice. These assistantships were realized for the first time last summer and resulted in full satisfaction to both the students and their employers. The students received free board and rendered valuable services. The position of famulus, as it is called in Hungary, will be officially recognized and continued.

Marriages

HENRY G LEHRER, Wadsworth, Ohio, to Miss Margaret Mary Jamcke of Manistee, Mich., Sept 27, 1937.

LEO RALPH BROWN to Miss Leah Isadora Cohn, both of Chicago, in East Chicago, Ind., Oct 10, 1937.

MARVIN B MOREHEAD, San Jose Calif., to Miss Maxine Parsons of Big Stone Gap, Va., Dec 7, 1937.

JAMES TALTON O'NEAL, Columbus Ga., to Miss Nadine Julia Clarke of Enfield, N C., Dec 23, 1937.

ROBERT E MULLARKY, Seattle, to Miss Katherine Leach of Fairchild, Conn., Oct 30, 1937.

EARL HENRY DIEHL to Miss Ruby Clyde Cain, both of Dunedin, Fla., Oct 27, 1937.

WILLIAM F CUNNINGHAM to Miss Grace Stocking both of Seattle, in October 1937.

Deaths

Percy Willard Roberts * New York, Boston University School of Medicine, 1894, instructor of orthopedic surgery, Cornell University Medical College, 1904-1910, formerly associate professor of orthopedic surgery at the New York Post-Graduate Medical School, Columbia University, served during the World War, member of the American Orthopedic Association and the American Academy of Orthopedic Surgeons, fellow of the American College of Surgeons, aged 70, consulting surgeon to St Agnes Hospital and White Plains Hospital, White Plains, N Y, and the Hospital for the Ruptured and Crippled, where he died, Nov 8, 1937

Harvey Shepard Thatcher * Little Rock, Ark., Rush Medical College, Chicago, 1917, professor of pathology at the University of Arkansas School of Medicine, served during the World War, at one time instructor in medicine, Columbia University College of Physicians and Surgeons, New York, and assistant professor of pathology, Ohio State University, Columbus, member of the American Association of Pathologists and Bacteriologists, member of the council of the Southern Medical Association, aged 52, died, January 20, of an accidental sulfuric acid poisoning

Gideon Brown Miller * Washington, D C, University of Virginia Department of Medicine, Charlottesville, 1890, member of the American Gynecological Society, fellow of the American College of Surgeons, formerly clinical professor of gynecology at the George Washington University School of Medicine, formerly chief associate examiner on the Washington Subsidiary Board of the National Board of Medical Examiners at various times on the staffs of the Columbia, Emergency and Garfield Memorial hospitals, aged 75, died, Nov 1, 1937 of cerebral hemorrhage and arteriosclerosis

Robert Addison Milliken * Little Rock, Ark., Harvard University Medical School, Boston, 1918, associate professor of orthopedic surgery at the University of Arkansas School of Medicine, director and chief orthopedic surgeon of the Crippled Children's Division of the Public Welfare Department, on the staffs of St Vincent's Infirmary, Baptist State Hospital, City Hospital and Arkansas Children's Home and Hospital, member of the Clinical Orthopedic Society and the American Academy of Orthopedic Surgeons, aged 46, died suddenly, Nov 1, 1937, in a local hospital, of heart disease

Frank Wilcox Pinneo, Newark, N J, Columbia University College of Physicians and Surgeons, New York, 1901, member of the Medical Society of New Jersey and the Associated Anesthetists of the United States and Canada, for many years secretary of the Essex County Medical Society, served during the World War, aged 71, on the staffs of the Presbyterian Hospital, Babies Hospital-Cott Memorial, Hospital and Home for Crippled Children and the Newark City Hospital, where he died, Nov 18, 1937, of coronary occlusion

William Merle d'Aubigne Carhart, Peekskill, N Y, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1889, member of the Medical Society of the State of New York, attending eye surgeon at the Manhattan Eye and Ear Hospital, New York, 1891-1911, for many years oculist in the bureau of child hygiene, New York City Department of Health, aged 73, served in various capacities at the Peekskill Hospital, where he died, Nov 13, 1937 of cerebral thrombosis

Sigmund Pollitzer * New York, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1884 formerly professor of dermatology at the New York Post-Graduate Medical School, Columbia University, member, past president and vice president of the American Dermatological Association, member of the American Association of Pathologists and Bacteriologists, served during the World War, on the staff of the Lenox Hill Hospital, aged 78, died, Nov 1, 1937

Hampton Ray Kenaston * Bonesteel, S D., Chattanooga (Tenn.) Medical College, 1898, connected with the Indian Service, formerly director of medical licensure, South Dakota State Board of Health and Medical Examiners at various times county coroner mayor of Bonesteel and president of the school board, member of the county exemption board during the World War, aged 67, died Nov 28 1937, in a hospital at Sioux City, Iowa of arteriosclerosis and coronary thrombosis

Louis Jacob Pritzker * Chicago, Northwestern University Medical School Chicago 1891, instructor of gynecology at his alma mater from 1905 to 1910, professor of ob gynec at the Jenner Medical College from 1913 to 1918, served during the

World War, for many years on the staffs of the Norwegian American Hospital and the Grant Hospital, aged 69, died, Nov 5 1937, in a hospital at Kenosha, Wis., of coronary thrombosis.

Clyde Ellsworth Cotton, Asheville, N C., Cleveland College of Physicians and Surgeons, Medical Department of the University of Wooster, 1885, member of the Medical Society of the State of North Carolina, at one time professor of anatomy at his alma mater, formerly physician in charge of "The Pines," Black Mountain, aged 75, died, Nov 29, 1937, of nutral insufficiency

Albert Watkins Evans, Washington, D C, National Homeopathic Medical College, Washington, 1895, veteran of the Spanish-American and World wars, chief of the foreign and insular subdivision of the Medical and Hospital Service, Veterans Administration, aged 67, died, Nov 7, 1937, in the Veterans Administration Facility, of carcinoma of the cecum

William Ernest Long * Mason City, Iowa, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1899, member of the Associated Anesthetists of the United States and Canada, formerly county coroner and member of the state legislature, aged 66, died, Nov 25, 1937, in the Park Hospital, of cerebral hemorrhage

Anna Perkins * Eldorado, Kan., College of Physicians and Surgeons, Medical Department Kansas City University, Kansas City, 1897, at one time member of the city board of education and state board of health, formerly on the staff of the Susan B. Allen Memorial Hospital, aged 65, died, Nov 24, 1937, of aplastic anemia, purpura haemorrhagica and lung abscess

Samuel Barfield Palmer, Macon, Ga., College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1893, member of the Medical Association of Georgia, veteran of the Spanish-American War, aged 66, died, Nov 5, 1937, in the Veterans Administration Facility, Hines, Ill., of adenocarcinoma of the paranasal sinuses

Thomas R. Ogden, Jasper, Texas, Memphis (Tenn.) Hospital Medical College, 1891, member of the State Medical Association of Texas, past president of the Jasper-Newton Counties Medical Society, county health officer, for many years on the staff of the Hardy-Hancock Hospital, aged 73, died, Nov 29, 1937, of carcinoma of the stomach

William C. Portmann * Jackson, Minn., Western Reserve University Medical Department, Cleveland, 1882, an Affiliate Fellow of the American Medical Association, served the village of Jackson as council member, mayor, school board president, and Jackson County as coroner, aged 79, died, Nov 3, 1937, of cerebral hemorrhage and arteriosclerosis

Harry Edward Siske, Glenduff, N H., Tufts College Medical School, Boston, 1898, member of the New Hampshire Medical Society and the New England Roentgen Ray Society, assistant physician to the New Hampshire State Sanatorium for the Treatment of Tuberculosis, aged 60, died, Nov 2, 1937, at Hanover, of coronary occlusion

Charles Sahler Hornbeck, Rochester, N Y, McGill University Faculty of Medicine, Montreal, Que., Canada, 1921, member of the Medical Society of the State of New York, on the staffs of the Rochester General Hospital and the Strong Memorial Hospital, aged 39, was killed, Nov 7, 1937, in an automobile accident.

J. Clifford Scott * Oakbourne Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1893, medical superintendent of the Pennsylvania Epileptic Hospital and Colony Farm, aged 71, died, Nov 16, 1937, in the Chester County Hospital, West Chester, following an operation for appendicitis

Valesius Augustus Murray, Patton, Pa., Kentucky School of Medicine, Louisville, 1892, University of Maryland School of Medicine, Baltimore, 1893, member of the Medical Society of the State of Pennsylvania, for many years a member of the school board, aged 70, died Nov 8 1937, of cerebral hemorrhage

Everett Joseph Stone, Newport, N H., University of Vermont College of Medicine, Burlington, 1913, member of the New Hampshire Medical Society, on the staff of the Carrie F. Wright Memorial Hospital, aged 46, died Nov 9 1937, in Lemper, of cerebral hemorrhage and essential hypertension

Walter John Robbins, New Britain, Conn., University of Pennsylvania Department of Medicine, Philadelphia 1897, Hahnemann Medical College and Hospital of Philadelphia 1898, member of the Connecticut State Medical Society, aged 62, died, Nov 22 1937, of carcinoma of the esophagus

George Clifton Mahoney * Somerville, Mass., Medical School of Maine, Portland 1894, on the courtesy staff of the Somerville (Mass.) Hospital and the Lawrence Memorial Hos-

pital, Medford, aged 72, died, Nov 9, 1937, of multiple myeloma of the spine, ribs and skull and bronchopneumonia

Frank Ross Cutler, Cedar Falls, Iowa, State University of Iowa College of Medicine, Iowa City, 1912, member of the Iowa State Medical Society, past president of the Black Hawk County Medical Society, aged 50, died, Nov 4, 1937, in the Finley Hospital, Dubuque, of pneumonia

Arthur Sautter, Albany, N Y, Albany Medical College, 1894, member of the Medical Society of the State of New York, formerly clinical professor of dermatology and contagious diseases at his alma mater, at one time health officer, aged 68, died, Nov 11, 1937, of coronary thrombosis

Franklin Frost Sams, Charleston, S C, Medical College of the State of South Carolina, Charleston, 1890, member of the South Carolina Medical Association, formerly acting assistant surgeon in the U S Public Health Service, aged 70, died, Nov 2, 1937, in the Riverside Infirmary

Frank Wallace Miller @ Los Angeles, Rush Medical College, Chicago, 1894, member of the Pacific Coast Oto-Ophthalmological Society, fellow of the American College of Surgeons, on the staff of the Children's Hospital, aged 66, died, Nov 1, 1937, in the Good Samaritan Hospital

Harry Hazelton Penquite, Massena, Iowa, Drake University College of Medicine, Des Moines, 1909, member of the Iowa State Medical Society, city physician, formerly member of the city council and school board, aged 51, died, Nov 16, 1937, of cerebral hemorrhage

George Byron Brown, Portsmouth, Ohio, Bellevue Hospital Medical College, New York, 1897, member of the Ohio State Medical Association, served during the World War on the staff of the Mercy Hospital, aged 65, died, Nov 21, 1937, of carcinoma of the prostate

Charles Demarest Kline @ Nyack, N Y, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1892, for many years health officer, on the staff of the Nyack Hospital, aged 70, died, Nov 3, 1937, of valvular heart disease

Benjamin Whitney Patrick, Toledo, Ohio, Toledo Medical College, 1903, member of the Ohio State Medical Association, on the staffs of the Mercy and St Vincent's hospitals, aged 60, died, Nov 17, 1937, of cerebral thrombosis and coronary sclerosis

Jay Worth Fry @ Creston, Iowa, Omaha (Neb.) Medical College, 1897, past president of the Union County Medical Society, formerly on the staff of the Greater Community Hospital, aged 62, died, Nov 6, 1937, of cerebral hemorrhage and arteriosclerosis

Samuel Richard Deanes, West Point, Miss., University of Louisville (Ky.) Medical Department, 1885, member of the Mississippi State Medical Association, health officer, on the staff of the Ivy Hospital, aged 75, died, Nov 26, of organic heart disease.

Jasper L Augustine, Ladora, Iowa, State University of Iowa College of Medicine, Iowa City, 1893, member of the Iowa State Medical Society, fellow of the American College of Surgeons, aged 69, died, Nov 3, 1937, of Parkinson's disease.

David Cummins Mebane, Evanston, Ill., University of the City of New York Medical Department, 1883, formerly a druggist at one time member of the city council of Wilkes-Barre, Pa., aged 81, died, Nov 16, 1937, of carcinoma of the stomach

John Bennett Hoskins, Fenton, Mich., State University of Iowa College of Homeopathic Medicine, Iowa City, 1900, township health officer, served during the World War, aged 61, died, Nov 7, 1937, in Iowa City, after a gallbladder operation

Henry Hill Harrison, Asheville, N C, Jefferson Medical College of Philadelphia, 1905, member of the Medical Society of the State of North Carolina and the American Academy of Pediatrics, aged 54, died, Nov 20, 1937, of coronary thrombosis

Charles Edward Ritchie, Stephens, Ark (licensed in Arkansas in 1903), member of the Arkansas Medical Society, for many years justice of the peace, aged 61, died, Nov 16, 1937, at the Camden (Ark.) Hospital, of cerebral hemorrhage

George William Fitch, St Petersburg, Fla., Columbian University Medical Department, Washington, D C, 1890, Hahnemann Medical College and Hospital of Philadelphia 1891 served during the World War, aged 71, died, Nov 21 1937

Hollie Linder, Kansas City, Mo., Meharry Medical College, Nashville, Tenn., 1917, aged 48 on the staffs of the Kansas

City General Hospital and the Wheatley-Provident Hospital, where he died, Nov 22, 1937, of acute glomerular nephritis

Hugh Thomas Montgomery, South Bend, Ind., Chicago Medical College, 1875, member of the Indiana State Medical Association, formerly county coroner, aged 87, died, Nov 8, 1937, of coronary thrombosis and sclerosis

Ollie Allison Ryder @ Alexandria, Va., University College of Medicine, Richmond, 1913, served during the World War, on the staff of the Alexandria Hospital, aged 49, died suddenly, Nov 27, 1937, of heart disease.

Michael Vincent Mulcahy, San Jose, Calif., University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1889, aged 69, died, Nov 17, 1937, of arteriosclerosis, diabetes mellitus and hemorrhage of the bowel

James Perry Herd Dykes, Redwood City, Calif., University of Tennessee Medical Department, Nashville, 1891 at one time health officer of Stafford County, Kan., aged 77, died, Nov 4, 1937, of arteriosclerosis

Caroline Lichtenberg, Buffalo, University of Buffalo School of Medicine, 1898, member of the Medical Society of the State of New York, aged 72, died, Nov 14, 1937, of cerebral hemorrhage and arteriosclerosis

Livingstone Lovell Lewis @ Hoboken, N J, New York University Medical College, 1898, served during the World War, on the staff of St Mary's Hospital, aged 60, died, Nov 9, 1937, of coronary thrombosis

John Ingram Clark, Santa Ana, Calif., Rush Medical College, Chicago, 1897, member of the California Medical Association, formerly city health officer, aged 62, died, Nov 3, 1937, of cerebral hemorrhage

Joseph Odess Prejean @ Abbeville, La., Tulane University of Louisiana School of Medicine, New Orleans, 1932, aged 29, died, Nov 2, 1937, in the Charity Hospital, New Orleans, of pulmonary tuberculosis

Ernest Price Oldham, Coalville, Utah, Northwestern University Medical School, Chicago, 1906, member of the Utah State Medical Association, aged 62, died, Nov 17, 1937, of cerebral hemorrhage

John McFarland, Centerville, Iowa, Chicago Homeopathic Medical College, 1887, Hahnemann Medical College and Hospital, 1905, member of the Iowa State Medical Society, aged 83, died Oct 5, 1937

Joseph O'Conner Donelan, Manila, P I, L R C S, Ireland, 1875, L K Q C P, Ireland, 1876, past president of the Philippine Islands Medical Association, died, Oct 5, 1937, in London, England

Leo Gregory McKellops, Neosho, Mo., St. Louis University School of Medicine, 1900, also a dentist, served during the World War, aged 69, died, Nov 17, 1937, of diabetes mellitus

Robert L Holaday, Paoli, Ind., Hospital College of Medicine, Louisville, Ky., 1896, member of the Indiana State Medical Association, formerly county coroner, aged 67, died, Oct 21, 1937

Murray Baldwin Kirkpatrick, Trenton, N J, University of Pennsylvania Department of Medicine, Philadelphia, 1907, aged 53, died, Nov 25, 1937, of pulmonary edema and hemiplegia

Walter Simpson Bates @ Barre, Mass., University of Vermont College of Medicine, Burlington, 1896, aged 75, died, Nov 27, 1937, of chronic bronchitis and myocarditis

William James Kennedy, Musquodoboit Harbour, N S, Canada, University of Western Ontario Medical School, London, Ont., 1897, aged 64, died, Nov 9, 1937

S Edgar Miles, St. Louis, Homeopathic Medical College of Missouri, St. Louis, 1880, aged 81, died, Oct 26, 1937, in St. Anthony's Hospital

Julius Edwin Franzel @ Fort Atkinson, Wis., Wisconsin College of Physicians and Surgeons, Milwaukee, 1902, aged 62, died Oct 14 1937

William Henry Montague, Baltimore, Temple University School of Medicine, Philadelphia, 1915, aged 56, died, Nov 6 1937, of myocarditis

Guy Wilbur Taylor, Grass Creek, Wyo., State University of Iowa College of Medicine, Iowa City, 1917, aged 47, died in October 1937

Trumble Pratt, Media, Pa., Hahnemann Medical College of Philadelphia, 1870, aged 93, died, Nov 16, 1937, of cerebral hemorrhage

Ernest Andrew Miller, Anaheim, Calif., Chicago College of Medicine and Surgery, 1910, aged 53, died, Oct 18, 1937

Correspondence

PATIENT DESCRIBED IN ARTICLE BY COLLENS AND WILENSKY

To the Editor—We wish to avail ourselves of this opportunity to correct an error that was inadvertently made under figure 5 on page 2128 of the issue of THE JOURNAL of Dec. 25, 1937, when reference was made to the treatment of the patient by Dr. Samuels for seven years. Dr. Samuels has informed us that the patient was treated by him from Sept. 18, 1929, to Aug. 13, 1931, approximately two years.

WILLIAM S. COLLENS, M.D.
NATHAN D. WILENSKY, M.D.
Brooklyn

ESSENTIAL AMINO ACIDS IN NUTRITION

To the Editor—I am writing in reference to the editorial "Essential Amino Acids in Nutrition" (THE JOURNAL, Dec. 18, 1937, p. 2070). The editorial deals with the extensive and valuable chemical work of Prof. W. C. Rose and his collaborators on the nutritional value of amino acids as a part of the diet of young rats. Several references are being made to a cause and effect relationship between amino acids and growth, e. g., some amino acids being "essential for growth," "promoting normal growth," "in order that growth might occur," "indispensable for growth," "the fractions tested for their growth-promoting properties," "the twenty-two common amino acids now can be classified precisely according to their growth effects," "the animal body cannot synthesize this substance at a rate fast enough to permit normal growth," and so on.

I believe that most physiologists will differ with you in the interpretation of these studies. While their biochemical significance is outstanding and the discovery of a new and essential amino acid is an important contribution, the experiments do not aim at making an analysis of the growth problem as the physiologist and biologist understand it.

The manifold processes which may be summed up under the term "growth" are of general biologic significance and apply to tissue cultures or unicellular organisms as well as to the earthworm, starfish, frog or mammal. The capacity for growth is inherent in protoplasm, independent of the food supply, since tissues and organisms may sometimes "grow" even under conditions of malnutrition. Most certainly, many forms are able to grow without the aid of all the nine or ten amino acids "essential" for the rat. It will therefore be difficult to classify, as your editorial states, "the twenty-two common amino acids precisely according to their growth effects," unless one adds in the rat.

Furthermore, the biologic phenomenon "growth" consists of a number of special processes as, for instance, increase in size, increase in mass only, increase and simultaneous transformation of the mass, increase and aging of the mass, physiologic increase in mass beyond the species size after the normal growth period is over, resumption of growth after standstill, and neoplastic growth. Thus, an approach to the problem by nutritional chemistry cannot be expected to furnish an analysis of growth physiology. Nutrition studies will help to determine whether or not a certain amino acid must be present in the diet so that an animal may thrive, but they give us no clue as to whether such an acid is a special growth promoting acid or performs some other task in metabolism. The very fact that "the feeding of all the known amino acids, including methionine, failed to promote growth, while the addition to such a complex mixture (over twenty components) of a small amount of α -amino β -hydroxy-butyric acid made normal growth possible would indicate that threonine does not merely act as a growth promoter but in some other capacity.

In other words, I believe that it will be shown in the course of time that different amino acids perform different and special functions in the complicated process of development of immature animals as they do in the more stabilized metabolism of the mature. I have mentioned how complex these developmental processes are, and to emphasize this further it may be pointed out that there are many animal forms which during their course of development not only change their mass quantitatively but also transform their structures qualitatively from one type into others. As an example, one need only think of the many transformations that an insect organism goes through between the egg cell stage and maturity. All this is growth in the wider biologic sense. So is the transformation of normal liver cells into a carcinoma with metastases in other organs.

Your editorial makes reference to the extensive studies by Osborne and Mendel. I am sure you are well aware of the fact that there had been other amino acid studies long before these two eminent investigators entered the field, and many since. There have been extensive tissue culture studies by Carrel, Ebeling, Baker and others, extensive studies by Abderhalden, Voegtlin, Hammett and others. Since 1929, amino acid studies dealing with specific physiologic effects (not the nutritional) of amino acids (prepared by Dr. Olive Hoffman or obtained from Hoffmann-La Roche Laboratories, Nutley, N. J.) have been carried on in this university by Gubernatsch and Hoffman with the support of the International Cancer Research Foundation, Philadelphia.

I. GUDERNATSCH,
New York University Graduate
School, Department of Biology,
Washington Square

METRAZOL CONVULSIVE PHENOMENA IN DEMENTIA PRAECOX

To the Editor—In connection with the metrazol convulsive treatment of schizophrenia we recently encountered a phenomenon to which I think attention should be called.

Ordinarily we expect the metrazol reaction to occur within less time than a minute after injection with the drug. In our experience the onset is usually from fifteen to twenty seconds later. We recently had a young man who was given a unit dose of 3 cc., to which he responded with fixed expression and staring lasting a matter of a few seconds, a fairly typical petit mal reaction from which he recovered as usual. At the time of the next treatment he was given 4 cc. of metrazol with even less reaction. On the third treatment he was given 5 cc. There was no question whatever about the drug being in the vein. In approximately fifteen seconds he showed an exceedingly mild clonic convulsion, the tonic stage not being recognized at all. This entire reaction was over in considerably less than a minute and was followed by perhaps two minutes of confusion, after which he seemed to be just as he was prior to the treatment. Between sixteen and twenty minutes following the injection of the drug he rather suddenly developed a severe tonic state shifting to the clonic seizure. The seizure was quite severe. He became markedly cyanotic. During the seizure he had an ejaculation and an involuntary emptying of the bladder. He came out of the seizure in the usual time and manner. This seizure and the sequence of events in it had not differed in any way from other strong reactions we have had in the metrazol work except for the delay in onset. In subsequent treatments this patient has reacted in the usual manner.

This experience demonstrates to us the necessity for continuing the careful observations for quite some time after the treatment.

HOSEA W. McADOO, M.D., Arlington Heights, Ill.
Medical Director, Ring Sanatorium and Hospital

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

DIAGNOSIS OF CHEST PAIN

To the Editor—A white man aged 43, height 5 feet 11 inches (180 cm), weight 190 pounds (86 Kg.), has been a fireman for twelve years and has always been in excellent health. In July 1935 he was overcome in a smoke-laden room, fell to the floor and in a brief period was extricated in a semiconscious and coughing state. After being removed into the fresh air he gradually recovered but the coughing and the pain in the chest continued for five days. The cough gradually subsided completely but to date the pain to the right of the sternum in the lower part of the chest continues as originally. This is over a period of two and a half years. A dull ache and a pulling sensation are present constantly while at rest and this condition is accentuated when he bends his head to the left, bends his trunk to the left or takes a deep breath. He is unable to walk at a rapid rate to climb stairs without exaggeration of the pain or do anything that requires more than moderate exertion. A test of rapidly walking down and up a stairway induces an agonized expression on his face, severe pain in his chest and dyspnea and extends his head fully in order to breathe. After a few minutes he perspires profusely and the condition gradually subsides. There is no cough, expectoration, rise of temperature or physical change other than decreased breath sounds over the right lung which are not accentuated after exercise. The heart electrocardiogram, blood pressure, pulse, blood urine and Wassermann reactions are normal. X-ray examination of the chest reveals nothing save a slight increase in the density of the hilus shadows and a mild parenchymal infiltration of the right lower lobe. The vital capacity is 6,059 cc. His chest measures 41 inches (103.5 cm.) on inspiration, 40 inches (101.6 cm.) normal and 39½ inches (99.5 cm.) on expiration. The condition is always better in the summer than in the winter. The place of the accident was an old burning frame house. Bronchoscopic examination apparently did not reveal anything of significance. What type of pulmonary injury did this man sustain? What other diagnostic methods may be employed in order to determine the nature of this pain? What can be done in order to alleviate this painful condition? MD Wisconsin

ANSWER—It is difficult to correlate pulmonary injury with this train of symptoms extending over a period of two and a half years and producing no physical abnormalities. A spontaneous pneumothorax might account for the initial symptoms. A fractured rib with traumatic pleurisy or mediastinitis is a possibility. It is even possible that rupture of the lung tissue or a small bronchus may have occurred. Such accidents are not uncommon in cases in which mechanical means of resuscitation are employed. But none of these could logically be blamed for a train of symptoms extending over a period of two and a half years, especially in the absence of physical and x-ray evidence.

A cardiovascular condition must be considered. A coronary thrombosis or, more likely, the rupture of an atheromatous abscess into a coronary vessel must be ruled out. The exaggeration of the pain on bending the head or body does not agree with this possibility, but the inability to exercise without pain and dyspnea makes the consideration of this possibility imperative. Serial electrocardiograms should show changes in contours if coronary disease is present. Aneurysm of the aorta is a possibility. Traumatic aneurysm is not uncommon and a small dissecting aneurysm might be very difficult to determine. Fluoroscopy at various angles would be helpful in ruling out this condition. Mediastinitis with traction about the root of the aorta would produce such symptoms, but it is difficult to assign a cause for it in this case.

An injury to one or more of the dorsal vertebrae must be ruled out. Such an injury with resulting pressure on the intercostal nerves might produce the constant pain with exacerbation on motion. If this is the case, the dyspnea must be due to the pain alone. The fact that the pain is less severe in warm weather is consistent with such a possibility. A careful physical and x-ray examination of the spine should settle the question.

A diaphragmatic hernia is within the range of possibilities. Such hernias often produce pain closely simulating that of coronary disease. The usual gastro-intestinal x-ray examination should sufficiently explore this possibility.

Lastly, and only lastly, the psychic reaction of the patient should be carefully weighed. In such situations there is usually much speculation about the presence of serious cardiovascular disease. When such speculation comes to the ear of a patient with the proper psychic background, a profound impression is

made that may set up an inexplicable train of symptoms. This possibility should be considered only when all other diagnostic efforts have failed.

In asking what may be done to alleviate the condition, the correspondent does not state what has already been done. Nitrites or the purine bases should relieve the pain of coronary disease. Posture and salicylates should at least affect the pain of vertebral disturbance. Intercostal nerve block and sympathetic ganglion injection would be valuable diagnostic tests and might prove of temporary therapeutic value.

It is impossible to outline a satisfactory plan of treatment until a more accurate diagnosis is made.

DOSAGE OF SULFANILAMIDE

To the Editor—Has the optimal safe dosage of sulfanilamide been established for children with such diseases as otitis media due to *Streptococcus haemolyticus*? At the hospital with which I am connected we used 0.2 Gm. per kilogram. This however is a large dose and I am afraid of it for a child not in a hospital. In the cases in which granulocytopenia has followed the use of this drug has the onset been abrupt? Would a white blood cell count every third day be safe? May phenobarbital, codeine and acetylsalicylic acid be used during treatment with sulfanilamide? I should appreciate as accurate an answer as is possible with the present state of our knowledge. MD New York

ANSWER—Little fundamental pharmacologic investigation has been made on sulfanilamide. There is rapidly growing up in this country a sizable literature dealing with sulfanilamide which ultimately will lead to a better evaluation of the drug. Until this literature is available and until clinical experiences have been confirmed, it is best that the product should be given without the concurrent administration of any other drug except possibly sodium bicarbonate, and the latter should be given in cautious dosage in order not to cause hyperventilation or alkalosis. There is some ground for the belief that the doses of sulfanilamide which are now being used are excessive. In case of streptococcal invasion, equally satisfactory results may be obtained by reducing the dose.

WATERMELON JUICE IN NEPHRITIS

To the Editor—Recent newspaper articles are giving accounts of cases in which watermelon juice is credited with favorable results in the treatment of nephritis. Is this an accepted course of treatment and if so what is the pharmacologic justification? If its field is limited under what conditions is it advised and what are the details of administration? MD New York

ANSWER—The Council on Pharmacy and Chemistry has never considered a preparation of watermelon juice. Although mild diuretic properties commonly have been attributed to watermelon juice, the existence of any scientific evidence which established the therapeutic value of the preparation has not been obtained.

Bliss, Morrison and Prather (An Investigation of the Diuretic Properties of Watermelon Juice, *Am J Pharm* February 1933, p. 53) carried out animal experiments for the purpose of determining the accuracy of the common statement that the juice of the watermelon is a "good diuretic." These authors reported that in rabbits fresh watermelon juice does not produce consistent diuretic effects and that in these animals it is not an efficient diuretic. They also reported that the effects produced by water-bath concentrates of the fresh juice indicate that there is some irritating substance either in the fresh juice or formed when the juice is concentrated on the water-bath and that this substance is capable of producing profound local and remote irritation of the digestive and urinary tracts.

SCHAMBERG'S DISEASE

To the Editor—For several months I have had under my care a woman who has Schamberg's disease. She has been to see a dermatologist, but treatment to date has been unsuccessful and she is becoming discouraged. Kindly advise me if there is any treatment which I can use that would be at all effective. DARWIN KIRBY MD Champaign Ill

ANSWER—Schamberg's disease is probably due to partial stasis or imperfect circulation of the involved parts. The pigment is iron-containing, such as would be derived from red cells. Treatment directed toward improving the efficiency of the circulation of the legs might do some good. Thus, a minimum amount of standing or strain on the lower extremities, the use of an elastic bandage, and sclerosing injections of varicose veins may be indicated. Schamberg's disease ordinarily fades spontaneously, leaving a more or less faint, yellowish or light brown pigment. Ordinary measures against this

residual pigment such as are used, for instance, for freckles, may be tried cautiously. For this purpose mercury bichloride from 1 3,000 to 1 300 solution or ammoniated mercury ointment from 10 to 20 per cent are simple, inexpensive and as good as anything else. Their effective action depends on scaling off the epidermis. On a leg with a poor circulation, great caution should be observed in the use of these irritants lest a dermatitis result that gets out of hand. The weaker strengths of these preparations should be tried first and only gradually the stronger. On the other hand, Schamberg's disease is a harmless, symptomless dermatosis. Perhaps if there is nothing else associated that demands treatment, the best advice might be for the patient to forget about her legs.

TANNIC ACID FOR COLDS

To the Editor—About the middle of December 1937 Dr Irving S. Cutter had an article in his health column in the Chicago Tribune entitled Tannic Acid Discouraging to Colds. In this article he recommends a 0.5 per cent solution of tannic acid in water sprayed into the nose several times daily to prevent colds and to obviate the nasal effects of allergy. He also recommends the nasal use of powdered tannic acid in petrolatum oil or glycerin for the same purpose. Since this article appeared I have had several inquiries as to the advisability of the use of tannic acid for such purposes and have felt somewhat doubtful about endorsing his views on account of the fact that tanning or any other procedure which inhibits ciliary action is usually harmful. M D, Illinois

ANSWER—The use of nasal sprays of astringent solutions such as tannic acid or zinc sulfate can by no means be considered an established preventive in the treatment of colds. It was found by experiments on monkeys that a suitably thorough application of astringent solutions to the upper portions of the nasal mucous membrane was capable of preventing poliomyelitis infection. It was reasoned in consequence that such treatment might not only be useful in human beings for this purpose but also possibly prevent other infections that originate in the nasal passage, including colds. There is, however, no scientific proof that this is the case with human beings as regards either poliomyelitis or colds. It is probably necessary to damage the membrane in order to make it an unsuitable culture medium for micro-organisms. While this may be justifiable in case of threatened poliomyelitis it does not seem a reasonable procedure to attempt in the prophylaxis of the cold.

EPIDERMOLYSIS BULLOSA

To the Editor—A boy, aged 3 years breaks out with vesicular eruptions ranging from a pea to a quarter (24 mm) in size. These eruptions are found on the upper extremities below the elbow and on the lower extremities below the knee joint. The lesions are absolutely painless and contain a straw colored somewhat gelatinous fluid. After the vesicle is broken it leaves a reddened raw moist surface which rapidly heals within a few days. The site then is a smooth pinkish area of new skin surrounded by the thickened dry scaly and darker skin which is characteristic of the skin of both extremities. Any slight abrasion is within twelve to twenty four hours followed by the formation of a blister. An abrasion however is not necessary for the vesicular eruption. The child may be free from the lesions for a period of a week and then suddenly have from five to six vesicles crop out within a few hours. The condition first made its appearance when he was 6 months of age. At that time a small vesicle was noticed on the dorsal surface of his right hand. An insect bite was thought to be the cause but within three days his entire body was covered with similar lesions. These disappeared under local treatment. The condition is present throughout each season of the year. Complete examination finds the patient a normal healthy and active child. The mother reports that she had a similar condition at his age. After trying numerous therapeutic measures she finally obtained relief after taking poison ivy antigen injections. She took one injection each year for ten years and was not troubled with the condition while taking the injections or after discontinuing them. She is now 28 years of age. The mother's skin resembles that of the child on both lower and upper extremities but is free from vesicular eruptions. Every form of external treatment has been tried without relief. Numerous dermatologists have been consulted. I should like to have your opinion as to the diagnosis and treatment. This seems to be an allergic condition. What diagnostic and therapeutic measures would you suggest along this line? M D Nebraska

ANSWER—The most likely diagnosis of this child's ailment is epidermolysis bullosa. There is no reason to believe this is due to any form of allergy. Almost the entire description is compatible and points to this disease. This disorder is usually hereditary and seems to be true here, since the mother's skin eruption probably was epidermolysis bullosa also. Trauma, even though slight enough to escape notice, produces fresh blisters. It is difficult to say just what the vesicular eruption was over the entire body that just preceded the present complaint. Epidermolysis bullosa of the hereditary type, however, may begin as long as two years after birth. The generalized eruption probably was a coincidence and had nothing to do with the succeeding traumatically induced bullae. Epidermolysis

bullosa hereditaria may disappear at puberty or at any time afterward. Quite likely on this basis the mother's eruption ceased when she was 18 years old. It is doubtful whether the injections of poison ivy antigen had any influence in this. Often the bullae continue to form indefinitely and nothing is known that will ameliorate them or prevent their forming except care to avoid trauma. If injections of poison ivy antigen represent a new effective remedy, it would be interesting to try them in this child. It should be borne in mind that a few accidents have been reported to follow such injections.

FECAL FISTULA

To the Editor—Can you give any suggestions for the nonsurgical treatment of a fecal fistula? In the case concerned the fistula developed on the ninth day following an operation for a gunshot wound of the abdomen with perforation of the small intestine and sigmoid. How long can one attempt medical treatment before surgical closure should be done? M D Texas.

ANSWER—It is difficult to answer this query without first hand knowledge of the appearance and location of the fistula, moreover, roentgenograms with injection of an opaque medium would be valuable. If there is no serious excoriation of the skin, it would seem safe to wait for from three to six months in the hope that the fistula might close spontaneously. Mild irritation of the skin is often benefited by cleansing with soap and water, drying and painting with 1 per cent gentian violet solution. Kaolin powder is often helpful.

DYSMENORRHEA AND FRIGIDITY

To the Editor—A young white married woman has a menstrual history which began at 11 and was quite regular not particularly painful and moderate in amount until about two years ago when she had an attack of diphtheria. Following administration of large doses of diphtheria antitoxin and convalescence she did not menstruate for three months and then had severe dysmenorrhea lasting the first two days of her period. The flow was heavy and lasted from seven to eight days. There has since then been some spotting which at irregular intervals is almost as heavy as her regular flow from about the tenth to the fourteenth day of her period frequently associated with low abdominal cramping always unilateral and not always on the same side. Since her marriage about eighteen months ago she has become aware of a frigid state and is despondent over the absence of what she thinks should be her natural sex instincts. The patient is a nullipara her height is 61½ inches (155 cm) she weighs 110 pounds (50 Kg) and she is well developed physically. The blood pressure is 110 systolic 72 diastolic and the pulse rate with the patient seated is 68. There is no evidence of thyroid disturbance other than her statement that she is more comfortable in warmer rooms (about 75 F) and that she feels tired all the time. No means are at hand for measuring the basal metabolic rate. Examination of the urine gives negative results. Vaginal examination reveals normal external genitalia and an almost infantile uterus slightly anteverted. There are no abnormal ovarian masses or tenderness. Treatment to date has included intramuscular injection of 15 cc of antituberculin S twice a week for three months which produced little if any improvement in the menstrual symptoms. Oral administration of mammary substance (desiccated) 5 grains (0.3 Gm) twice daily for the ten days preceding each menstrual period resulting in slight decrease in flow and duration of the period and thyroid tablets 1 grain (0.065 Gm) twice daily for the past two months which she says made her feel more like doing her house work. There has been no improvement of her frigid state. Her husband is cooperating to the best of his ability. There has been no coitus for the past two months. She has never experienced an orgasm or any particular desire for coitus but states that it is not entirely disagreeable to her. I wish to know whether my attempted endocrine therapy has been in the right direction and will welcome any suggestions relative to a plan of treatment of the menstrual difficulties as well as suggestions for overcoming her frigidity. M D Nebraska

ANSWER—The menstrual difficulty would seem to be of endocrine origin and the intermenstrual pain and bleeding are probably associated with ovulation. It is probable from her other symptoms that there may be some thyroid deficiency. It might be well to add a small dose of iodine to the thyroid. The administration of either of these therapeutic agents without taking a reading of the basal metabolism should be pursued cautiously, and frequent observations of the patient should be made.

The menstrual difficulty and the hypoplasia of the uterus suggest the desirability of using or stimulating the production of estrogen. In her case substitutional endocrine therapy would seem to be indicated. While the use of most of these preparations is theoretical and frequently unsatisfactory, it would seem logical to try the effect of some of the estrogenic preparations for a trial period. There would seem to be no reason for not combining the administration of thyroid, iodine and estrogen.

As regards the frigidity, the husband must be interrogated and it must be determined whether he is suffering from rapid or premature ejaculation and whether he indulges in the prac-

tice of withdrawal Either of these conditions will produce frigidity in the wife and must be remedied In some persistent cases of frigidity the condition is due to diminished or absent sensation in the vaginal mucous membrane and treatment with galvanic electricity often brings about a cure (Huhner, *Max Absence of Pleasure in the Female During Sexual Intercourse*, *Am Med* 39 522 [Nov.] 1933) In the development of the infantile uterus, intra-uterine faradism with cervical electrodes in combination with the sinusoidal current certainly develops the uterus and will be beneficial also for the menstrual disturbances These treatments can be given simultaneously with endocrine administration

CASTOR OIL FOR INFANTS AND CHILDREN

To the Editor—Many of the young graduates of today are condemning the use of castor oil under any and all circumstances I am surrounded by such a group of younger men and I should like your opinion on the judicious use of castor oil in common colds in infants and children also as an early treatment in diarrhea previous to other medications such as paregoric bismuth compounds or phenyl salicylate Are there any grounds for objection to a single dose of castor oil in an infant having all the symptoms of a common cold and green stools? M D West Virginia

ANSWER—Castor oil is logically classified under the purgatives as a mild aperient In passing into the intestine it is saponified by the pancreatic juice, and the ricinoleates thus formed are irritant and cause purgation

While the exact etiology of the common cold has not been definitely accepted, it is probably sometimes a virus disease The giving of a purgative in a virus disease of the upper air passages could hardly be termed a specific method of treatment Frequently in infants and young children the common cold is associated with nutritional upsets and with intestinal manifestations, including the so-called parenteral diarrhea The routine use of castor oil in treatment of the common cold may be an additional aggravating factor in an already upset intestinal tract Isaac A Abt showed that the administration of certain purgatives to infants may cause renal irritation

It may be concluded that there is no rationale for the treatment with castor oil of either the common cold or diarrhea from whatever cause in infants and children According to Brenemann, the use of therapeutic starvation with repeated catharsis was once a routine treatment for diarrhea in infancy He states that fortunately this pernicious practice is steadily becoming less prevalent, since it has been found that such catharsis is not only useless but harmful

TETANUS ANTITOXIN IN HYPERTENSION

To the Editor—A man about 56 years of age stuck a nail into his hand while working in a chicken yard and the same afternoon was given tetanus antitoxin (1 500 units) That night he had a light stroke of cerebral apoplexy He had had hypertension for several years Is hypertension a contraindication to the use of tetanus antitoxin?

WALLIS CONE M D Williston S C

ANSWER—So far as known at present there seems to be no ground for assuming that hypertension contraindicates the use of tetanus antitoxin unless it should be in patients who are liable to a severe reaction on account of sensitiveness to horse proteins

SUBLUXATIONS OF CERVICAL SPINE

To the Editor—I am located in a hotbed of chiropractic practitioners and consequently have occasion frequently to see patients to whom they have made suggestions It seems that every patient has a misplaced dislocated or subluxated first and second cervical vertebra producing all the ills known to mankind On reading several orthopedic textbooks I find little mention made of such a condition that is chronic subluxation of the atlas or axis Are there any authentic records of such conditions being possible without the patient having any definite history of trauma? I have seen several excellent roentgenograms of the cervical spine taken by these practitioners without seeing any displacements which they had convinced the patients they had Any references on this subject would be appreciated

R NED WHITE M D Springfield Mo

ANSWER—A subluxation in the cervical region is not possible in a healthy spine without trauma The experience recounted is not at all unusual It is astonishing how insistent members of this cult are that a dislocation is present in a spine even though the most carefully taken x-ray films show none Chronic subluxation of the atlas and axis exists only in the minds of these cultists and one is justified in refuting such a diagnosis Stubborn unwillingness on the part of opinionated advisers to accept negative observations has resulted in many a patient enduring days and nights of fear and worry until reassured by some consultant with a more balanced outlook

PULSUS ALTERNANS AFTER CORONARY OCCLUSION

To the Editor—A man aged 70 who had a severe coronary occlusion four years ago and a slight one last February has developed pulsus alternans His systolic blood pressure is 170 for the strong beats and 120 for the weak the diastolic is 90 The heart rate is from 70 to 74 and the rhythm is regular except during periods of slight dyspnea which occur several times daily and especially in the early morning hours when the dyspnea is present there are many premature contractions Some edema of the ankles has been noted for several years The patient has retired from his profession and leads a restricted life taking exercise by walking a few blocks daily He is fairly comfortable most of the time without any medication Please tell me whether the pulsus alternans affects the prognosis markedly and what drug treatment if any is indicated

M D Missouri

ANSWER—The pulsus alternans in this case is of unusually high degree, if it is certain that the marked drop in pressure of the weak pulsations is not the result of prematurity of these pulsations, sometimes the prematurity of extrasystoles is but slight and can be determined with accuracy only by an electrocardiogram taken at the time of their occurrence It is noted that there are at times many premature contractions in this case, their prematurity may vary However, the occurrence of pulsus alternans in such a patient is perfectly consistent with the history of serious coronary disease and present evidence of left ventricular weakness (periodic dyspnea) The presence of pulsus alternans is in most cases simply confirmatory evidence of great weakness of the left ventricle, but in such high degree as noted here it must be regarded as a distinctly bad prognostic sign, indicating that the duration of life will probably be short, a matter of months or a year or two at most, except in rare cases The more adequate the treatment, by rest, digitalis especially, and diuretic drugs if needed, the longer the life This patient should be kept constantly under the influence of digitalis in moderate dosage

BILE FLOW AND DRAINAGE OF DUCT AFTER OPERATION

To the Editor—Is absence of a flow of bile from the hepatic duct during operation for relief of common duct obstruction always of fatal significance? Is it acceptable technique in such an operation to remove stones and gallbladder and suture choledochostomy without drainage of ducts by tubes subsequently?

M D Chicago

ANSWER—If there is no obstruction in the common duct, the absence of a flow of bile is of serious significance If there has been an obstruction which is removed at operation, the flow of bile may gradually start again In any event the common bile duct should always be drained and the gallbladder should be removed if it is diseased and if there is no neoplastic obstruction to the common duct In the event of the latter condition, a choledochojunostomy or a choledochogastrostomy is best performed

SODIUM BICARBONATE IN COLDS

To the Editor—On what is the use of sodium bicarbonate as a preventive or in the treatment of the common cold based? Has any scientific work ever been done to prove or disprove its efficacy? Are there any statistics at large or in institutions showing what effect the taking of soda has in aborting a cold?

M D South Carolina

ANSWER—There is no scientific basis for the idea that sodium bicarbonate is a preventive in the treatment of the common cold No scientific work worthy of such designation has been done either to prove or to disprove the claim, and owing to lack of scientific information as to what a cold really is and the great variability of its incidence in individuals as well as in communities, a scientific investigation on this question would be most difficult

REMISSION OF ARTHRITIS IN PREGNANCY

To the Editor—In *THE JOURNAL* Dec 25 1937 page 2161 appears a communication reciting the remission of symptoms of arthritis in a woman during each of nine pregnancies The answer states that this interesting remission of arthritic symptoms during pregnancy has not been noted in the literature of chronic arthritis Whereas this relationship has not been frequently mentioned I called attention to it in an article

The Nature of Arthritis and Rheumatoid Conditions in *THE JOURNAL* Dec 25 1920 p 1762 The statement was made that any critical observer can satisfy himself that the incidence of some conditions falling under the foregoing general head [viz increased metabolism] such as pneumonia and pregnancy may be followed by temporary improvement or entire surcease of symptoms in chronic arthritis In the light of what is known now about arthritis conditions other than increased metabolism are presumably acting also though this factor may well play a contributory role The striking case of remission of arthritis during nine pregnancies cited by the correspondent again calls attention to the necessity of recognizing the many and varied factors operative favorable and otherwise in the arthritic syndrome

RALPH PEMBERTON M D Philadelphia

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL February 5 page 462

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS *Parts I and II* Examinations will be held in all centers where there is a Class A medical school and five or more candidates who wish to write the examination Feb. 14, 16, May 9, 11 (limited to a few centers) June 20, 22 and Sept. 12, 14. Ex. Sec. Mr. Everett S. Elwood, 225 S. 15th St. Philadelphia

SPECIAL BOARDS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY *Written examination for Group B applicants* will be held in various cities throughout the country April 16. *Applications due Feb. 15. Oral examinations for Group A and B applicants* will be held at San Francisco June 13, 14. Sec. Dr. C. Guy Lane, 416 Marlboro St. Boston.

AMERICAN BOARD OF INTERNAL MEDICINE Examinations will be held in various centers of the United States and Canada Feb. 14. Chairman Dr. Walter L. Biering, 406 Sixth Ave. Suite 1210, Des Moines, Iowa.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY *General oral clinical and pathological examinations for all candidates (Groups A and B)* will be conducted in San Francisco June 13, 14. *Application for admission to Group A examinations must be on file before April 1.* Sec. Dr. Paul Titus, 1015 Highland Bldg. Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY San Francisco June 13. Washington D. C. Oct. 8. Oklahoma City Nov. 15. *All applications should be filed immediately and case reports in duplicate must be filed not later than sixty days before the date of examination.* Sec. Dr. John Green, 3720 Washington Blvd. St. Louis Mo.

AMERICAN BOARD OF OTOLARYNGOLOGY San Francisco June 10, 11. Sec. Dr. W. P. Wherry, 1500 Medical Arts Bldg. Omaha.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY San Francisco, June 11. Sec. Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington D. C.

AMERICAN BOARD OF RADIOLOGY San Francisco June 10, 12. Sec. Dr. Byrl R. Kirklin, 102 110 Second Ave. S.W. Rochester, Minn.

AMERICAN BOARD OF UROLOGY San Francisco June 11, 13. *All condensed case reports must be filed by April 1. Written examination* will be held in various cities in the United States and Canada April 2. Sec. Dr. Gilbert J. Thomas, 1009 Nicollet Ave. Minneapolis.

District of Columbia Reciprocity Report

Mr. Paul Foley, assistant secretary, Commission on Licensure, reports 20 physicians licensed by reciprocity from Sept. 28 through Dec. 21, 1937. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
George Washington University School of Medicine (1935) 2	Maryland	(1933)	New Jersey
Georgetown Univ. School of Medicine (1932) (1933)	(1934)	(1933)	Maryland
Howard Univ. College of Medicine (1932) Georgia	(1933)	(1933)	Maryland
Northwestern University Medical School	(1934)	(1934)	Illinois
Tulane Univ. of Louisiana School of Medicine (1932)	(1934)	(1934)	Louisiana
Johns Hopkins University School of Medicine (1921)	(1921)	(1921)	New York
University of Maryland School of Medicine and College of Physicians and Surgeons (1932)	(1934)	(1934)	Maryland
University of Minnesota Medical School	(1929)	(1929)	Iowa
Creighton University School of Medicine	(1935)	(1935)	Nebraska
University of Oklahoma School of Medicine	(1927)	(1927)	Oklahoma
Temple University School of Medicine	(1933)	(1933)	Penn.
Vanderbilt University School of Medicine	(1928)	(1928)	California
University of Virginia Department of Medicine	(1934)	(1934)	Virginia

Florida November Examination

Dr. William M. Rowlett, secretary, State Board of Medical Examiners, reports the examination held in Jacksonville Nov. 15-16, 1937. Sixty-two candidates were examined, 43 of whom passed and 19 failed. The following schools were represented:

School	PASSED	Year Grad	Per Cent
University of Arkansas School of Medicine (1936) 75 (1937) 80	2	(1923)	75.7
Georgetown University School of Medicine (1934) 75 (1935) 78	3	(1932)	75.5
Emory University School of Medicine (1935) 77.8 (1936) 76.5	5	(1917)	75
University of Georgia Medical Department	(1921)	(1921)	76.6
Rush Medical College	(1919) 81.6	(1936)	81.6
School of Medicine of the Division of the Biological Sciences	(1933)	(1933)	75.5
University of Illinois College of Medicine	(1913)	(1913)	80
University of Louisville School of Medicine (1934) 75.2	(1935)	(1935)	79.8
Tulane Univ. of Louisiana School of Medicine (1923) 76.3	(1931)	(1931)	82.9
University of Maryland School of Medicine and College of Physicians and Surgeons	(1927)	(1927)	75.8
University of Michigan Medical School	(1932)	(1932)	76.9
University of Minnesota Medical School (1935) 80.9	(1936)	(1936)	77.3
Columbia University College of Physicians and Surgeons	(1935)	(1935)	84
University and Bellevue Hospital Medical College (1917)	(1917)	(1917)	75.5
Duke University School of Medicine (1935) 75.1	(1937)	(1937)	78.2
Ohio State University College of Medicine	(1927)	(1927)	75
Univ. of Cincinnati College of Medicine (1929) 83.2	(1936)	(1936)	75

Jefferson Medical College of Philadelphia	(1914)	77.5
University of Pennsylvania School of Medicine	(1927)	76.9
(1934) 76.5 (1936) 80.9		
Meharry Medical College	(1934)	75
University of Tennessee College of Medicine	(1937)	75
Medical College of Virginia	(1937)	75
University of Virginia Department of Medicine	(1915)	77
(1929) 77.2 (1935) 75		
McGill University Faculty of Medicine	(1937)	75
Licentiate of the Royal College of Physicians and Licentiate of the Royal College of Surgeons Edinburgh	(1933)	79.1
School	FAILED	Year Grad Per Cent
University of Alabama School of Medicine	(1914)	67.5
College of Medical Evangelists	(1932)	71.7
Yale University School of Medicine	(1921)	66.2
Georgetown University School of Medicine	(1915) 61.7	71
Tulane University of Louisiana School of Medicine	(1922)	59.5
Tulane University of Louisiana School of Medicine	(1935)	72.8
University of Maryland School of Medicine	(1908)	69.2
Tufts College Medical School	(1919)	66
University of Michigan Medical School	(1913)	66.2
Columbia University College of Physicians and Surgeons	(1904)	57.1
Long Island College Hospital	(1927)	71.1
Ohio State University College of Medicine (1923) 72.4	(1934)	71.3
Hahnemann Medical College and Hospital of Philadelphia	(1897)	71.9
Jefferson Medical College of Philadelphia	(1931)	73.7
University of Pennsylvania School of Medicine	(1916)	70.9
Vanderbilt University School of Medicine	(1933)	69.6
University of Toronto Faculty of Medicine	(1926)	62

Book Notices

Pediatric Urology By Meredith F. Campbell, M.S., M.D., F.A.C.S., Professor of Urology, New York University College of Medicine, New York. With a section on Bright's Disease in Infancy and Childhood. By John D. Lyttle, A.B., M.D., Assistant Professor of Diseases of Children, College of Physicians and Surgeons, Columbia University, New York. In two volumes. Cloth. Price \$15 per set. Pp. 576, 540 with over 1,350 illustrations. New York: Macmillan Company, 1937.

The field of pediatric urology has grown rapidly in recent years, although as Campbell states in his preface "it is still in the diaper age." Few books dealing with this most important and neglected subject cover the field as exhaustively and authoritatively as do these two volumes. The author is well known to urologists and pediatricians for his current contributions in this field and the two volumes reflect that experience. The text is distinctly original in organization and the material is based on a rich clinical background.

Volume I opens with a lucid and comprehensive chapter on methods of examination and diagnosis. The author discusses the technical phases of urologic diagnosis in infants and children aided by most instructive diagrams and illustrations. His presentation of interpretation of urologic symptoms is particularly well done. The discussion of history taking, physical examination, urologic examination (special examination of urine and blood, roentgen study of the urinary tract, cystography, cystoscopy, ureteral catheterization, divided renal function tests and pyelography) leaves little to be desired. It is concise, to the point, and practical. Chapter II deals with obstructive urography and is distinctly original in its type of presentation. Chapter III deals with the clinical considerations of anatomy, physiology, embryology and anomalies of the urogenital tract and is copiously illustrated with diagrams and roentgenograms. Chapter IV deals with urinary infections, nontuberculous, tuberculous and unusual types (syphilis, coccidioides disease, actinomycosis and bilharziasis).

Volume II starts out with a well written chapter on Bright's disease by Dr. Lyttle. Dr. Lyttle is also well known for his contributions to pediatric literature on the subject of nephritis in children. He handles this controversial subject in a most practical and fundamental manner. His omission of complicated pathologic subdivisions of the disease and substitution of less specific clinical classification is refreshing and useful. Data on normal and pathologic urinary observations (including Addison's counts of the urinary sediment) is given in the appendix. Chapter VI discusses the diseases of the male and the female genital tract, and succeeding chapters deal with urogenital injuries, urinary calculi, tumors of the urogenital tract, neuromuscular uropathy, enuresis and urologic surgery. The two volumes are well balanced current treatises on pediatric urology. The text is beautifully illustrated by numerous diagrams, drawings and roentgenograms. Every chapter has a well selected current bibliography. If the physician desires a practical classic on the subject of pediatric urology he will have it with these two volumes.

Le artropatie croniche (escluso quello da gormi conosciuti) Dal Dott. (vicino Zappalà) Collaborazione del Prof. Giuseppe Lazzaro. Prefazione del Prof. Cesario Antonucci, chirurgo primario degli Ospedali Rionali di Roma. Paper. Price 25 lire. Pp 237 with illustrations. Rome Luigi Pozzi 1936

It is difficult to write a short review on a book so replete with factual statements and covering such a vast field. In the general part the author discusses focal infections, their localization and relation to joint diseases, dissemination, immunity, and the curative effect of removal of foci. Then follows a review of the field of allergy in relation to chronic arthritis, the blood picture and sedimentation time, the general roentgenologic appearance of arthritis, and a classification. The second part is devoted to a thorough presentation of the clinical pathology and pathologic anatomy of the different forms of arthritis. In the infectious type (group 1) the primary and secondary chronic arthritis, including Still's disease, are described, the noninfectious type (group 2), or arthrosis, is divided into osteoarthrosis deformans in the stricter sense and the arthrosis due to metabolic changes and glandular deficiency, neurogenic arthrosis, the primary osseous arthrosis. There is also a discussion of some forms of arthrosis not generally recognized as entities, such as the osteoarthrosis of Heberden, the hereditary osteoarthrosis, and the arthropathies associated with skin disease. The most interesting section is the third, dealing with the treatment, as a number of methods are mentioned which are not generally recognized. The chapter on the medical treatment of chronic arthropathies, written by Lazzaro, is devoted to the discussion of vaccine treatment, the stimulative treatment, thermotherapy and medicinal treatment of the various arthritic conditions. The chapter on the surgical treatment of chronic arthritis, which is written by the principal author, includes, besides the generalized recognized methods of arthroplasties and arthrodeses, tenotomies, myotomies and capsulotomies, also interesting methods such as endo articular and periarticular injections, fenestration of the capsule, synovectomy, and perforation of the femoral epiphysis. A paragraph is devoted to parathyroidectomy, although no definite conclusions are drawn. The same is true of the operations on the sympathetic nervous system. The book on the whole is concisely written and therefore rather strenuous reading, but it covers practically all that is known or observed on arthritis, without being arbitrary on controversial points. In its kind it is unusually complete and thorough and can be recommended to all those who are interested in this important subject.

Roma y Moscú. Impresiones de un cirujano argentino. Por el Prof. Jello Zeno. Paper. Pp 127 with illustrations. Rosario Argentina. Cooperativa del centro estudiantes de la Facultad de ciencias medicas farmacia y ramos menores Ltda. 1937

This is the second book which this gifted and noted surgeon has written on his experiences and observations of medicine as practiced in Russia. By acting in a sort of official capacity, the author had unusual opportunity to observe the work on traumatic surgery. He is particularly emphatic in pointing out the vast advances that have been made in the public health organization and particularly in the operation of centers for traumatic surgery. A sanitary nucleus exists in each city and district as a component part of the Central Organization of Public Health. In the hospital this nucleus consisted of physicians, a delegate of the local soviet and a delegate of the workers. While in other countries the medical profession is entirely professional, in Soviet Russia the physician acts as a medical consultant and adviser to the different departments of sanitation and is at the disposal of the Commissariat of Public Health. An interesting item is that the latter proposes to double the number of physicians in Russia, which in 1935 reached 82,000. The author's travel from Moscow to Irkutsk and his experiences and description of the medical life and the postgraduate studies which are going on in this far off Siberian town are especially interesting. Leaving Russia, the author turns to his experiences at Boehler's clinic in Vienna. He was deeply impressed by the painstaking accuracy of the work and particularly the systematic manner with which a large number of patients were treated. One gets a conception of the amount of clinical material going through this clinic from the author's statement that in six months not less than 1,886 patients with traumatism of the hand, excluding the carpus, were examined and treated. Treatment is carried out strictly under the well

known Boehler triad of principles: the prompt and most perfect reduction, constant and interrupted immobilization as long as required for the consolidation, and the institution of functional treatment during immobilization, i. e., exercise of all muscles and articulations not directly involved in the fracture. In the chapter on the Istituto Rizzoli, so ably conducted by Professor Putti, the author gives a vivid description of the intensive activities and the great versatility of this famous orthopedic institute. Several of the more important procedures are described in detail, for instance, the treatment of the fracture of the neck of the femur, or the congenital dislocation of the hip, the so-called anterior block operation of Putti. The book is splendidly written and entertaining even to those who are already familiar with the activities of European clinics.

The Physiology of the Kidney. By Homer W. Smith. A. B. Sc. D. M. S. Professor of Physiology and Director of the Physiological Laboratories, New York University College of Medicine. Cloth. Price \$4.50. Pp 310 with 33 illustrations. New York: Oxford University Press 1937.

This book constitutes a clear and concise presentation and interpretation of the extensive literature, pertaining to the excretory function of the kidney, that has accumulated since 1920. An admittedly incomplete bibliography of some 497 references is included. In the introduction the author points out that the constancy of the internal environment is to a large extent dependent on the activity of the kidneys. A precise description of the nephron is followed by a simple exposition of the theories of renal excretion. The recent evidence pertaining to glomerular filtration and tubular reabsorption and excretion in different animals is then summarized. The remaining seven chapters of part I of the book are devoted to a discussion of the renal clearance. This discussion with its critical interpretations may be considered to be the most valuable portion of the book by those interested in the evaluation of tests of renal function. In the final chapter of the series on renal clearance a striking summarizing statement is made, namely, "Taking all available data into consideration, we conclude that in all vertebrates the inulin clearance is at the level of glomerular filtration." The chapters in part II are devoted to the role of the kidney in the regulation of the composition of the plasma and the excretion of electrolytes and such substances as hippuric acid and skiodan. Considering the complexity of the subjects and the space used, these chapters constitute an excellent critical summary of our present knowledge. Part III consists of chapters on the excretion of water, diuretics, the renal nerves, blood flow, and a comparison of the renal activity in mammals. The view that the hypophysis is normally concerned in the regulation of water excretion is tacitly accepted. The chapter on diuretics is brief but to the point. In fact, the entire book is devoid of extensive discussion, in places this amounts to a fault, because too much knowledge of the older, and even of the allied, contemporary literature on the part of the reader is assumed. The book will be of value as collateral reading for medical and graduate students, and of service to those clinicians who desire to read a review of the more recent investigations of the excretory activities of the kidney. The book does not provide a complete outline of the physiology of the kidney or notes concerning albuminuria, nephritis or other renal disorders.

The Principles and Practice of Rectal Surgery. By William B. Gabriel. M. S. F. R. C. S. Surgeon to St. Marks Hospital for Cancer, Fistula and Other Diseases of the Rectum. London. Second edition. Cloth. Price 28s. Pp 363 with 171 illustrations. London: H. K. Lewis & Co. Ltd. 1937.

This volume, as stated by the author, is a revision of the first edition with the addition of a chapter on surgical anatomy, prepared by the author in collaboration with Mr. O. V. Lloyd-Davies, and there are two other new chapters on injuries and sarcoma. Anything that comes from the pen of this author is worthy of consideration. The resources of St. Marks Hospital are at his disposal and he has made excellent use of them in his vivid portrayal of the problems with which he deals. This volume contains all the illustrations and descriptive material of the splendid first edition and with the added features mentioned there has resulted a new book which is worthy of commendation. In the words of the author, it should be found useful to "proctologists, to general surgeons, and to general practitioners."

Endocrinologie Clinique thérapeutique et expérimentale Par P. Sainton médecin honoraire de l'Hôtel Dieu II Simonnet professeur à l'École nationale vétérinaire d'Alfort et L. Brouha professeur à la Faculté de médecine de Liège Paper Price 130 francs Pp 534 with 153 illustrations Paris Masson & Cie 1937

This monumental work is perhaps the most comprehensive treatise on endocrinology that has appeared in recent years. In addition to introductory chapters devoted to general principles, each of the glands of internal secretion is considered individually. Anatomy, physiology, pathology, chemistry, diagnosis and treatment are all presented in turn. Much space is devoted to clinical syndromes. The authors have intentionally omitted a bibliography, as this would have been so extensive as to render infeasible publication of the book. This is a serious deficiency which will limit the usefulness of the work. Drs. Sainton, Simonnet and Brouha have included a remarkable amount of material, much of which is not readily accessible elsewhere. However, a few serious errors occur in the text, some of the data considered acceptable by the authors might better have been omitted (or at least subjected to proper criticism), and certain items which unquestionably belong in the book have been omitted. For instance, favorable reports on surgical manipulations and roentgen irradiation of the adrenals for the treatment of hyperthyroidism appear in the text without critical comment. Treatment of hypothyroidism with both epinephrine and thyroxine is described. Experimental literature on the adrenal cortex of dubious validity is given credence while reports of a more substantial nature are not mentioned. But despite these evident deficiencies there is a vast amount of valuable information in this book and it will be found highly useful for reference. It is excellently printed and profusely illustrated with drawings and photographs, well reproduced.

Practical Endocrinology Symptoms and Treatment By Max A. Goldzieher M.D. Endocrinologist, Gouverneur Hospital, New York City. Second edition. Cloth. Price \$5. Pp 344 with 41 illustrations. New York & London D. Appleton-Century Company, Incorporated 1937.

The first edition of this book was reviewed in *THE JOURNAL*, Aug. 24, 1935. The serious deficiencies pointed out at that time unfortunately still apply to the revised version. Changes have been limited to minor additions and deletions in the text, without repagination (but with the insertion of one extra page) and the addition of a fourteen page supplement. Bold face numbers inserted in the text refer to sections of the supplement. This review is concerned chiefly with the new material.

The author implies that estrone (theelin) is less properly given orally than estradiol (which he erroneously designates "estradiol," a different compound) or estriol (theelol). The available evidence indicates that estrone and products (such as amniotin) containing it are quite active orally. He recommends the use of dinitrophenol and dinitrocresol in the treatment of obesity and claims that he has yet to see his "first seriously undesirable reaction" in over 2,000 cases; he admits, however, having observed one case of cataract "attributed by the ophthalmologist to the medication," as well as occasional pruritus and urticaria. Of the sad results of other workers reported in *THE JOURNAL*, the author says "These papers mostly based on incidental observations have no value whatsoever if compared with the experience gained on our own vast material."

In the treatment of primary amenorrhea the reader is told that "ingestion of anterior pituitary substance, 15 to 45 grains daily, especially in combination with injections of an anterior lobe extract is not only helpful to bring on menstruation, but protects the ovaries against the damages described after prolonged sex hormone treatment." It is nowhere apparent, however, that the author or any one else has examined the human ovary for evidence of this alleged protective effect. As to the efficacy of dried pituitary preparations the author ventures emphatically to disagree with the Council on Pharmacy and Chemistry. "Oral administration of anterior pituitary substance is a valuable procedure notwithstanding the doctrinaire attitude of certain official quarters whose prejudices are impervious to the practically unanimous opinion of the experienced clinical endocrinologists." It should be unnecessary to add that as yet, neither in this book nor elsewhere, has this "opinion" been substantiated by a single adequate series of properly controlled observations.

As in the first edition, the author continues to regard roentgen irradiation or denervation of the adrenals in diabetes mellitus as a "hopeful field," despite the fact that it has recently been shown that in experimental diabetes not only is the secretion of epinephrine from the adrenals not increased but it may actually be spontaneously reduced. The lack of suitably controlled evidence of benefit and the not infrequent disastrous results of such manipulations in human beings seem not to deter the author from his hopeful attitude. The revised edition contains even more evidences of confusion as to the terminology, nature and value of commercial glandular products than were apparent in the original. An unfortunate typographic error appearing in both editions concerns the intravenous injection of calcium "chlorate," a dangerous substitute for the chloride.

It is apparent from the examples cited that Dr. Goldzieher's book can hardly be recommended as a disinterested, objective and scientific dissertation.

La thrombose de l'artère bronchique cause de dilatation bronchique chronique de l'adulte Par le Docteur J. M. Lemoine Paper Pp 191 with 27 illustrations Paris E. Le François 1936

This is a thesis, amplifying and trying to prove the theory advanced by the author's chief, Dr. P. Ameuille, that chronic dilatation of the bronchi in the adult is due to occlusion of a branch of a bronchial artery. The historical review gives a survey of all the theories that have been advanced to explain this condition, mechanical, inflammatory, developmental and nervous. All of these for various reasons the author finds inadequate. He describes briefly the anatomic and physiologic peculiarities of the bronchial arteries in man and then enlarges on the postmortem observations in nine cases of bronchiectasis, all of which showed evidence of important changes in the bronchial arteries. In most cases these were attributed to a tracheobronchial adenopathy. His experimental attempts to produce bronchiectasis by ligation of branches of the bronchial arteries in dogs were, however, unsuccessful. This the author explains was due to the rich anastomoses found in the bronchial arteries of the dog, making it difficult to deprive the bronchial wall of adequate circulation. An attempt to verify the observation of former investigators that the intraperitoneal injection of bacterial cultures in the guinea pig is likely to produce bronchiectasis through arterial or lymphatic transmission of the organisms to the peribronchial tissues also failed. In spite of the unsuccessful experimental evidence, the author concludes, because of the arterial changes noted, that this cause best accounts for the pathogenesis of bronchiectasis, and particularly for the latent dry forms. All other theories previously advanced he considers less satisfactory. The book is well written, covers the literature thoroughly, and should be of interest primarily to pathologists. Further confirmation of these pathologic observations is necessary, however, before one can accept an explanation which is based on only nine necropsies, seven of which were observed by the author or his chief and two others found in the literature.

The Diabetic A B C A Practical Book for Patients and Nurses By R. D. Lawrence M.A. M.D. F.R.C.I. Physician in Charge Diabetic Department Kings College Hospital Fifth edition. Boards. Price 3s 6d. Pp 63. London H. K. Lewis & Co. Ltd. 1937.

This edition aims to give out information about the author's diet schemes, particularly the line ration diet, and to explain the new treatment necessitated by the use of the slow acting insulin compounds, the protamine insulins. In fact, the manual contains what the author would like to teach every patient if he had enough time—what diabetes is and how it is treated. The intention of the author is on the whole well achieved and if there is any quarrel with details in the book it may be with the disproportionate emphasis placed on the use of artificial, prepared foods. It is possible that the prevalent English practice in diabetes justifies the elaboration of diets involving the artificial prepared foods, but in America, where the use of higher carbohydrate diets is so general the use of such foods has been minimized. The line ration scheme of figuring the diet in diabetes is an ingenious device for simplifying the calculation. However, its explanation tends to be complicated and if the patient is not encouraged to master its intricacies he might abandon it. Discussion of protamine zinc insulin does

not seem sufficiently detailed to safeguard the patient in its use, in view of the fact that it is of so recent origin. On the whole, however, the book has the great virtues of being simple, clear and concise.

Pre Natal and Post Natal Management By J. St. George Wilson M.C. M.B. Ch.M. Hon. Obstetric and Gynecological Surgeon Royal Infirmary Liverpool. With a foreword by Sir Comyns Berkeley M.C., M.A. M.D. Cloth Price \$4. Pp. 206 with 81 illustrations. Baltimore: William Wood & Company 1937.

In the fourteen chapters of this book the author covers in great detail every aspect of antepartum and postpartum care. A special chapter is devoted to contraception and sterilization. For women who have ovarian hypofunction the author recommends quinine hydrochloride and estrogen during the last three or four weeks of pregnancy in order to avoid primary uterine inertia. Among the suggestions made to lower the blood pressure in eclamptic women the author includes repeated colonic lavage and drainage of the spinal canal. However, these procedures are rarely used in our country at the present time. Throughout the book the name Aschheim is incorrectly spelled Aschem. For the treatment of hydrocephalus the author recommends that a needle be passed through the abdominal and uterine walls into the cystic head to drain the fluid contents and cause its collapse. A far safer procedure is to puncture the thin fetal skull through the cervical canal. The author points out that in some cases of postabortion hemorrhage a thin walled cyst is found in one ovary. For this condition he says the "treatment is expectant, for cessation of bleeding will occur with degeneration or retrogression of the cyst. This will be accelerated by rupture of the thin walled cyst, which can often be done in the course of the bimanual examination. If the cyst wall is thicker than usual, it may need anesthesia to rupture it." This procedure, however, is fraught with some danger, especially if carried out by inexperienced practitioners. In spite of the foregoing minor criticisms the book should prove of great value to physicians. It is well written and the illustrations are numerous, clear and highly instructive. The large number of roentgenograms are beautifully reproduced.

Das Hormon des Corpus luteum (Biologie, Chemie und Klinik) Von Dr. Erich Fels, Leiter der Abteilung für Biologie und experimentelle Chirurgie am Instituto de Maternidad de la Sociedad de Beneficencia Buenos Aires. Paper. Price 12 marks. Pp. 169 with 40 illustrations. Leipzig & Vienna: Franz Deuticke 1937.

The author of this book was a member of one of the four groups of investigators responsible for the isolation and identification of the corpus luteum hormone. He is a former pupil and collaborator of Ludwig Fraenkel, who first demonstrated thirty-five years ago that the corpus luteum has an endocrine function. Dr. Fels is therefore well qualified to write on his chosen subject and he has here presented a concise yet comprehensive treatise on all phases of our knowledge of the corpus luteum. Among the sixteen chapters are sections on the historical background of investigations on the corpus luteum, methods of assay and standardization of progesterin, relation of the corpus luteum hormone to pituitary and mammary gland, interactions of progesterin and estrogen, effects of progesterin on the male genital tract, actions of this principle on extragenital structures and therapeutic applications of progesterin. Professor Slotta collaborated with the author in a chapter on the isolation, identification and synthesis of progesterone. The book is well printed and contains many illustrations, several in color.

Obstetrics for Nurses By Joseph B. DeLee, A.M., M.D., Consultant in Obstetrics, Chicago Lying-in Hospital and Dispensary, and Mabel C. Carmon, R.N., Chief Supervisor and Instructor in the Birthrooms, Chicago Lying-in Hospital and Dispensary. Eleventh edition. Cloth. Price \$3. Pp. 649 with 292 illustrations. Philadelphia & London: W. B. Saunders Company 1937.

The appearance of the eleventh edition of this standard textbook on obstetric nursing is evidence enough of its worth and popularity. The ever increasing interest in maternal welfare by physicians, nurses and the lay public makes this new revision timely. The material is carefully selected and arranged in a logical order. The concise and instructive manner of presentation is distinctive of the author, who has spent his lifetime in teaching obstetrics to nurses and doctors. The numerous illus-

trations add to the clarity of the text. More space is devoted in this edition to the technique and principles of practice in home environment in line with the author's ideas. If one is to find fault with trivial details, one would object to the inclusion of symphysiotomy, which is an operation of only historical significance today. Furthermore, delivery in the lateral Sims position is no longer practiced in this country. The questions at the end of each chapter are an aid to classroom work. The glossary on colored paper makes it more easily accessible to the student. The collaboration of Mabel C. Carmon in this revision represents a distinct tribute to a co-worker of twenty-five years.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Acts—Prohibition on Advertising of Prices Constitutional—The plaintiff in this case had been practicing dentistry in Richmond, Va., since 1930. He had advertised extensively, through the newspapers, the prices and terms charged for his professional services, had offered free dental examinations and had guaranteed satisfactory dental work. Such advertisements, from time to time, were illustrated with photographic cuts of teeth or bridge work. In 1936 the general assembly amended the dental practice act by empowering the state board of dental examiners to revoke or suspend a license of any dentist who advertised his services in a manner proscribed in detail in the amendatory act. The plaintiff thereupon sought to enjoin the state board of dental examiners from the threatened revocation or suspension of his license for engaging in advertising of the type prohibited by the act. The trial court dismissed the bill of complaint, and the plaintiff appealed to the Supreme Court of Appeals of Virginia.

The contention that the act violated the federal constitution, the court said, was disposed of by the United States Supreme Court in *Seiler v. Oregon State Board* 294 U. S. 608, 55 S. Ct. 570, a case involving the dental practice act of Oregon, which contained provisions similar to those in the Virginia act. In that case it was held that the restrictions on advertising did not constitute an arbitrary interference with the liberty and property guaranteed by the federal constitution but was a reasonable exercise of the protective police power of the state. The plaintiff in the present case did not question the right of the state, under its police power, reasonably to regulate the practice of dentistry but strenuously contended that such legislation must bear a fair relation to the public health, morals, safety or welfare of the people, and that so long as there is nothing untruthful in the advertising matter the public welfare is not adversely affected thereby. But, the court remarked, the exercise of police power is not limited to the prohibition of acts which are *malum in se*. The legislature may pass laws intended to prevent fraud even though the act prohibited is itself harmless. In recent years laws of the character here attacked, regulating the practice of dentistry, have been passed by a majority of the states. Thirty states, the court pointed out, prohibit the advertising of prices, twenty-eight prohibit the advertising of display signs carrying cuts or illustrations of teeth, twenty-one prohibit the advertising of free dental services, and nineteen outlaw the advertising of guaranteed dental work. The constitutionality of these laws has been attacked in numerous instances and in a majority of cases the statutes have been upheld. With one accord these court decisions point out that while the advertising of prices, terms and display of teeth, and so on, may not be harmful in itself, statutes of this character are aimed at the unscrupulous practitioner and quack, who usually resorts to such "high-powered salesmanship" methods to lure the ignorant and unsuspecting public to his office, that it is for the legislature and not the courts to say whether or not it is necessary, in order to close the door to such an unscrupulous practitioner, and to prevent the perpetration of fraud and deception on his patients, that all advertisements

except as permitted in the statute be prohibited. With this reasoning, the court in the present case expressed itself as in thorough accord.

It is a matter of common knowledge, the court said, that many laws intended to protect the public put restraints on the acts and conduct of men of honest motives and purposes. If the present statute burdens an honest business, the answer is that it burdens it "only that under its forms dishonest business may not be done." The statute does not destroy the plaintiff's right to practice his profession. It simply requires him, and every other dentist in the state, to conform to the ethics of the profession. There was no merit in the plaintiff's contention, the court said, that the statute was class legislation because it applied only to dentists and not to medical practitioners generally. Neither was there any merit in the contention that the statute violated the due process clause of the Virginia constitution "because it provides for the trial of a so called unethical dentist before a board composed exclusively of the so called ethical dentists." The argument was that, in a proceeding to revoke or suspend the plaintiff's license, the state board of dental examiners was not a fair and impartial tribunal because it favored the enforcement of the statute as written by the general assembly. The mere statement of this proposition shows it to be unsound. How can it be said, the court questioned, that the willingness of a tribunal to enforce the law as written renders the tribunal incompetent to conduct a trial? It might as well be argued that a judge of any court is incompetent to try a case because he favors the enforcement of the law as written.

The decree of the trial court, dismissing the complaint, was therefore affirmed—*Goe v Gifford et al (Va)*, 191 S E 783.

Accident Insurance Burns Sustained by Dentist as Result of Prolonged Use of Roentgen Rays—The plaintiff, a dentist, was issued three insurance policies by the defendant company, under which he was insured against loss resulting from bodily injuries effected through accidental means. While the policies were in force, ulcers appeared on the index fingers of both of the plaintiff's hands, resulting from the breaking down of the tissues of the fingers following a long and continued application of roentgen rays used in the treatment of his patient. Thereafter he was continuously disabled from performing one or more important daily duties pertaining to his profession. The insurer contended that the injuries were not effected through accidental means and refused to pay the benefits. The plaintiff thereupon brought suit and the jury returned a verdict in his favor. When the trial court denied the insurer's motion for a new trial, the company appealed to the Supreme Court of Errors of Connecticut.

The plaintiff, said the court, used the x-ray machine for the purpose of diagnosis in his profession and was skilled in its use. The evidence justified the jury in finding that the injury to the plaintiff's forefingers was due to exposure of these fingers to the roentgen rays a number of times, the cumulative effect of which was to cause the breaking down of the tissue and the appearance of the ulcers. The plaintiff did not intend to expose himself to the roentgen rays to such a degree as to produce injurious consequences. It was for the jury to determine whether the resulting injury was accidental in the sense of something unexpectedly taking place—not according to the usual course of things—or whether the result was one such as usually follows from ordinary means voluntarily employed. The ulcerations certainly constituted a bodily injury and the exposure of the plaintiff's fingers was an accident, in the opinion of the court, it was "an untoward event or condition not expected." The evidence justified the jury in finding further that the amount of tolerance to exposure to roentgen rays without injurious effect varies with the individual. Until the breaking down of the tissues appeared, it was not perceptible that there had been an overexposure or too frequent exposures. The unexpected and unanticipated event in this case, the court said, was not the exposure to the roentgen rays but the overdose of it producing the ulcers on the plaintiff's fingers.

The Supreme Court of Errors, therefore, held that the trial court did not err in denying the insurance company's motion for a new trial—*King v Traders Ins Co (Conn)*, 192 A 311.

Vaccination Exclusion of Unvaccinated Child from School Lawful—A New Hampshire law provides that no child shall attend a public or private school unless he has been vaccinated, or has had smallpox, or has submitted not less than three times to the process of vaccination or holds a certificate of the local board of health that he is an unfit subject for vaccination. The defendant refused to have his child vaccinated and it was denied admission to the public schools. A complaint was then sworn out against the defendant, charging a violation of another New Hampshire law requiring every person having the custody of a child to cause the child to attend school during all the time the public schools are in session. The defendant was convicted and brought exceptions to the Supreme Court of New Hampshire.

The defendant contended that the vaccination law was in conflict with the Fourteenth Amendment of the Federal Constitution and of the New Hampshire Bill of Rights. But, said the court, the general question of the constitutionality of the law had theretofore been raised and the law had been declared valid *Barber v School Board*, 82 N H 426, 135 A 159, *Cram v School Board*, 82 N H 495, 136 A 263. The court could see no reason to reexamine the question. Neither the defendant nor his son, the court continued, had a constitutional right to schooling which could not be limited by a requirement that the child be vaccinated before attending. The court thought it irrational for the defendant to claim that he did his full duty as a citizen and father when he demanded that his son be admitted to the school without vaccination. Irrational also was his claim that the vaccination law involved the state in the practice of medicine. The defendant's individual ideas, the court pointed out, whether "conscientious," "religious" or "scientific," did not appear to be more than opinions. They were not shown to involve any question of religious liberty. Since they were mere opinions, they were irrelevant and immaterial. The defendant's views could not affect the validity of the statute or entitle him to be exempted from its provisions. The legislature, not the defendants or the courts, determines the question of policy involved in public health regulations. If all men were to take the position that individual opinions were equivalent to rights, law would be replaced by anarchy. If the defendant's theory were accepted, no man could be convicted of drunkenness who insisted on the view that a noisy spree is a private right, no charlatan could be prevented from assuming to practice medicine if he felt the "call" to do so. It was therefore perfectly proper for the county solicitor to remind the jury that when a law does not please a person he has no right to ask a jury to permit him to violate it, and for the solicitor further to state that dissatisfied persons must seek relief in such a case from the legislature and not from the jury. The defendant refused to send his child to school vaccinated and he must pay the penalty for not submitting to a valid law. All exceptions of the defendant were overruled and the conviction, in effect, was affirmed—*State v Drew (N H)*, 192 A 620.

Society Proceedings

COMING MEETINGS

American Association for Thoracic Surgery Atlanta Ga Apr 4-6 Dr Richard H Meade Jr 2116 Pine St Philadelphia Secretary
American College of Physicians New York Apr 4-8 Mr E R Loveland 4200 Pine St Philadelphia Executive Secretary
American Orthopsychiatric Association Chicago Feb 24-26 Dr Norvell C La Mar 210 East 68th St New York Secretary
American Physiological Society Baltimore Mar 30-Apr 2 Dr A C Ivy 303 East Chicago Ave Chicago Secretary
American Society for Experimental Pathology Baltimore Mar 30-Apr 2 Dr Paul R Cannon University of Chicago Chicago Secretary
Annual Congress on Medical Education and Licensure Chicago Feb 14-15 Dr W D Culler 535 North Dearborn St Chicago Secretary
Federation of American Societies for Experimental Biology Baltimore March 30-April 2 Dr D R Hooker 19 West Chase St Baltimore Secretary
Mid South Post Graduate Assembly Memphis Tenn Feb 15-18 Dr A F Cooper Goodwyn Institute Bldg Memphis Tenn Secretary
Pacific Coast Surgical Association Los Angeles Feb 22-25 Dr H Glenn Bell University of California Hospital San Francisco Secretary
Southeastern Surgical Congress Louisville Ky March 7-9 Dr B T Beasley 701 Hurt Bldg Atlanta Ga Secretary
Tri States Medical Association of the Carolinas and Virginia Asheville N C Feb 21-22 Dr J M Worthington 804 Professional Bldg Charlotte N C Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them. Titles marked with an asterisk (*) are abstracted below.

American J. Digest. Dis. & Nutrition, Fort Wayne, Ind.

4 631 704 (Dec.) 1937

- Influence of Extrinsic Innervation on Human Gastric Motor Mechanism L. E. Barron New Haven Conn.—p. 631
Effect of Osmotic Changes in Small Intestine on Gastric Emptying in Man J. Gershon Cohen and H. Shay Philadelphia—p. 637
*Theory on Formation of Peptic Ulcer H. Necheles Chicago—p. 643
Peptic Ulcer Emergencies Study of Massive Hemorrhages and Acute Perforations Treated During Diagnosis of 916 Private Cases Suffering from Peptic Ulcer J. M. Blackford A. L. Smith, Seattle and D. H. Affleck Twin Falls Idaho—p. 646
Differential Diagnosis of Gastro-Intestinal and Cardiac Disorders (The Alvarez Lecture) P. D. White Boston—p. 650
Hemorrhage from Gastritis Gastroscopic Study E. B. Benedict Boston—p. 657
Cinefluorographic Studies of Lesions of Gastro-Intestinal Tract W. H. Stewart and D. Stetten New York—p. 665
Interdependence of Gastric Secretion and the Carbon Dioxide Content of Blood and Its Significance in Alkali Treatment of Peptic Ulcer E. D. Kiefer Boston—p. 667
*Observations on Gastric Acidity Before and After Development of Carcinoma of Stomach M. W. Comfort W. L. Butsch and G. B. Eusterman Rochester Minn.—p. 673
Psychobiologic Approach to Gastro-Intestinal Disorders K. J. Tiltston Waverly Mass.—p. 682

New Theory on Formation of Peptic Ulcer—The knowledge that stimulation of parasympathetic nerves liberates acetylcholine and the discovery by Dale and Feldberg that stimulation of the gastric vagus causes acetylcholine to appear in the venous blood from the stomach have opened a new approach to the genesis of peptic ulcer. Necheles investigated the effect of acetylcholine on the circulation of the stomach, the arteries, veins and capillaries isolated from fresh human stomachs, as well as on the stomachs of rats and dogs. It was found that acetylcholine produces a diminution of flow through isolated vessels. In perfusion experiments on the rat's stomach acetylcholine practically always effected marked vasoconstriction. In a series of experiments the stomach of a dog was prepared so that the flow through the gastric vein could be measured. In a third series of dogs, oncometry of the entire stomach was performed. The results showed that in the greater number of experiments small doses of acetylcholine, comparable to those liberated when the vagi are stimulated, produce a diminished flow of blood through the stomach, the diminution amounting to from 60 to 96 per cent. Therefore, overproduction and, more particularly, a continuous production of acetylcholine in the stomach will produce anoxemia of its tissues. Such anoxemia will be more severe in those regions in which most branches of the vagus nerves are distributed and will be more fatal on the lesser curvature of the stomach and in the duodenal bulb. Devitalized gastric and duodenal tissues are digested rapidly by the gastric and duodenopancreatic juices. These tissues are dissolved also by weak hydrochloric acid and sodium bicarbonate solutions without the presence of enzymes. Alternating exposure to active trypsin and pepsin solutions effects much faster digestion in frogs than active pepsin alone. In the light of these experiments and facts, one might expect to obtain the greatest incidence of ulcers in the duodenal cap and next to it on the lesser curvature, where alternating exposure to active trypsin and pepsin takes place regularly, where at the same time end arteries occur and where most branches of the vagus nerves are found, i. e., where most acetylcholine is produced. A fundamental question is whether persons with peptic ulcer produce more acetylcholine in their stomachs than normal persons. Many facts support this assumption. Most ulcer patients are persons of the worrying and high strung type. In eighty-two healthy male and female relatives of ulcer patients distinctly low values

for free acid were found after an Ewald meal, while the residue of the fasting stomach in the greater number of instances contained a high degree of free acid. From these observations the question arises whether peptic ulcer begins as a gastritis and whether the hyperacidity of the duodenal ulcer develops later.

Gastric Acidity in Carcinoma of Stomach—Comfort and his colleagues find that analysis following a gastric test meal was carried out before and after the development of carcinoma of the stomach in seventy-nine patients of all ages. The gastric secretory activity of the seventy-nine patients destined to develop cancer of the stomach was below normal before the development of cancer. After an interval of years averaging six, and after each patient had acquired cancer of the stomach, the percentage of achlorhydria had increased from 38 to 64.6 per cent, while the mean concentration of free hydrochloric acid in the gastric contents of the remaining twenty-eight patients who retained free acid was changed but slightly. The depression of gastric acidity in patients destined to have carcinoma of the stomach is a progressive and selective process, appearing early in life and at all ages. The low secretory activity of the stomachs of patients with gastric cancer is present, for the most part, before the development of cancer. The loss of gastric acidity occurred in patients both with high and with low concentrations of free acid, but more frequently in cases in which the concentration of acid was low before the development of cancer. A further reduction of gastric acidity occurs after the development of cancer. Theoretically, the low secretory activity of persons destined to have carcinoma of the stomach may be present at birth (a developmental defect in the secretory mechanism) or it may occur after birth as the result of an abiotrophy of the acid secreting cells or as the result of inflammatory destruction of the gastric mucous membrane. The loss of gastric acidity in adult life excludes a developmental defect as the cause of the loss in a considerable number of cases, while the presence of marked, diffuse atrophic gastritis in almost all cases of achlorhydria and the absence of a marked diffuse atrophic gastritis in almost all cases in which there is free hydrochloric acid in the gastric contents greatly favor chronic atrophic gastritis as the important cause. Chronic gastritis, as well as the tumor itself by its local and systemic effects, may be responsible for the depression of gastric secretion after the development of gastric cancer.

Archives of Ophthalmology, Chicago

19 1 170 (Jan.) 1938

- Syndrome of Groenblad and Strandberg Anirid Streaks in Fundus Oculi Associated with Pseudoxanthoma Elasticum J. Goedbloed Leyden Netherlands—p. 1
Surgical Treatment of Lacrimation H. Arruga Barcelona Spain translated by S. R. Gifford Chicago—p. 9
Galactose Cataract in Rats Factors Influencing Progressive and Regressive Changes Helen S. Mitchell and Gladys M. Cook, Amherst Mass.—p. 22
Tuberculous Sclerosis with Retinal Tumor Report of Case T. J. Bloch New York and B. A. Grove York Pa.—p. 34
Adenomatous Hyperplasia of Epithelium of Ciliary Body Report of Case J. E. L. Keyes and P. G. Moore Cleveland—p. 39
*Vitamin D and Myopia J. Laval New York—p. 47
Power and Magnification Properties of Contact Lenses P. Boeder Southbridge Mass.—p. 54
*Adie's Syndrome Report of Cases F. Kennedy H. Wortis J. D. Reichard and B. B. Fair New York—p. 68
Pneumococcal Bacteriophage Its Application in Treatment of Ulcers Corneae Serpens A. M. Rodigina Perm U. S. S. R.—p. 81
Abnormal Arteriovenous Communication in Orbit Involving Angular Vein Report of Case T. L. Terry and G. B. Fred Boston—p. 90
Diplococcus Pneumoniae and Streptococcus Viridans in Ocular Diseases Report of 100 Cases E. W. Newman Cheyenne Wyo.—p. 95
Special Form of Keratitis Caused by Friedlander's Pneumobacillus Report of Case with Review of Literature S. P. Chang Peiping China—p. 103
The Cataractous Lens Experimental and Clinical Studies I. S. Tassman, Philadelphia—p. 114

Vitamin D and Myopia—During the last six years there have been forty-eight myopic patients whom Laval has considered young (from 5 to 17 years of age) enough for trial treatment with vitamin D and milk. These patients have taken vitamin D and milk continuously and have been seen at intervals of nine months for from three to six years. In every one of these patients there has been an increase in the amount of the myopia. In some the increase has been only 1 diopter, in others

it has been as much as 25 diopters, but not one patient has had a decrease in the amount of the myopia or even an arrest of the progress. All the dietetic and hygienic measures instituted were of no avail in arresting the progress of the myopia. Accordingly, the author disagrees with those who say that treatment with vitamin D and calcium helps patients who have myopia by reducing the amount of the myopia, keeping it stationary or preventing as rapid an increase as is usually found in patients who have not used this form of therapy.

Adie's Syndrome—Kennedy and his associates call attention to a symptom complex which has repeatedly been mistaken for syphilis of the central nervous system. Ordinarily it consists merely in tonic reactions of one or both pupils and in the absence of some or all of the deep tendon reflexes. In general, the syndrome has been found in healthy young females without other signs of organic nervous disease. It is generally symptomless except for a not uncommon photophobia on passing from a dark to a light place. The ratio as to sex is about five females to one male. Many of the patients give evidence that the ocular signs have been present since childhood, they have lived many years without the appearance of any other signs or symptoms. Adie restricted the syndrome to those cases in which there are no other neurologic signs and to persons who are otherwise in good health. To report the syndrome in association with every sort of disease is to widen its significance progressively until it loses all meaning and value. Vasomotor instability is also frequently noted in patients presenting this syndrome. Adie's syndrome is a symptom complex which closely simulates syphilis of the nervous system and is not syphilis. Knowledge of the syndrome is indispensable to every physician who undertakes to diagnose syphilis of the central nervous system.

Journal of Nervous and Mental Disease, New York

86 645 764 (Dec.) 1937

- Personality Studies in Alcoholic Women F. J. Curran New York—p. 645
Changes in the Brain in Accidental Electrocution G. B. Hassin Chicago—p. 668
The Use of Graphology in Medicine G. C. Booth New York—p. 674
Recurrent Trigeminal Neuralgia (Migrainous) Associated with Cyclic Scotomas Bettermant with Estrin C. W. Lippman, San Francisco—p. 680
Experimental Induction of Infantile Behavior in Major Hysteria R. R. Dieterle and E. J. Koch Ann Arbor Mich—p. 688

Journal of Nutrition, Philadelphia

14 535 646 (Dec.) 1937

- Studies on Alleged Toxic Action of Cod Liver Oil Observations on Growth and Pathologic Changes in Animals Fed Large Amounts of Cod Liver Oil Ethel Burack and H. M. Zimmerman New Haven Conn—p. 535
Metabolism Studies with Rats Suffering from Fat Deficiency G. O. Burr and A. J. Deber Minneapolis—p. 553
Control Feeding Technique in Bone Calcification Studies Julia Outhouse Janice Smith and Lillian Merritt Urbana Ill—p. 567
Comparative Study of Growth Promoting and Bone Calcifying Effects of Several Carbohydrates Julia Outhouse Janice Smith Lillian Merritt and Florence R. White Urbana Ill—p. 579
*Nutritive Value of Proteins of Nuts in Comparison with Nutritive Value of Beef Proteins H. H. Mitchell and Jessie R. Beadles Urbana Ill—p. 597
Nutritional Well Being and Length of Life as Influenced by Different Enrichments of an Already Adequate Diet H. C. Sherman and H. L. Campbell with collaboration of P. B. Rice New York—p. 609
*Recovery of Carotene and Vitamin A from Butter When Cows Were Fed Unlimited Quantities of Green Rice F. W. Atkeson J. S. Hughes Bernice L. Kunerth W. J. Peterson and Martha Kramer Manhattan Kan—p. 621
Losses of Vitamin C During Cooking of Swiss Chard Faith Fenton Ithaca N. Y. D. K. Tressler Geneva N. Y. S. C. Camp and C. G. King Pittsburgh—p. 631

Nutritive Value of Proteins of Nuts and Beef—Mitchell and Beadles assessed the protein value in nutrition of English walnuts cashew almond filbert and Brazil nuts as compared with beef protein. The nutritive values of the proteins of these nuts were studied by determining the nitrogen intake and output of rats under conditions standardized so that significant biologic values could be estimated. They found that while the biologic values of the other nuts fall within the range of from 50 to 60 the cashew nut possesses a value of 72 only slightly below that of beef round 76.

Carotene and Vitamin A from Butter—To measure the recovery of carotene and vitamin A in butter under pasturage conditions Atkeson and his associates determined the carotene

and vitamin A content of the butter from three cows which were individually stall fed only green rice, the carotene content of which was known. Each cow was offered in two feeds daily all the rice she would consume. The carotene ingested daily averaged 3,507 Gm., equivalent to nearly 6,000,000 international units of vitamin A. The butter produced had an average carotene content per pound of 4,700 international units and 8,490 units of vitamin A. Of the carotene ingested daily only an average of 0.086 per cent was recovered daily as carotene in the butter and only an average of 0.154 per cent as vitamin A. The data seem to indicate that, when excessive amounts of carotene are fed, the ratio of carotene to vitamin A in the butter becomes rather constant at about 1 to 2.

Maine Medical Journal, Portland

28 275 296 (Dec.) 1937

- Foreign Bodies in the Tracheobronchial Tree G. O. Cummings Portland—p. 275
Infectious Mononucleosis R. B. Love Gorham—p. 282

Michigan State Medical Society Journal, Lansing

36 939 1030 (Dec.) 1937

- Maternal Mortalities G. Kamperman Detroit—p. 939
Optic Neuritis and Retrobulbar Neuritis Etiology and Treatment W. L. Benedict and F. L. P. Koch Rochester Minn—p. 946
The Thirtieth Anniversary of the Michigan Tuberculosis Association T. J. Werle Lansing—p. 959
*Sickle Cell Anemia Bone Marrow Studies H. A. Robinson Detroit—p. 964
Attempted Suicide with Insulin D. Donald and L. J. Foster Detroit—p. 967
Acute Laryngotracheobronchitis P. H. Holinger Chicago—p. 969
One Hundred Years of Medicine in Michigan H. E. Randall, Flint—p. 973

Sickle Cell Anemia—Robinson studied the bone marrow of a patient with severe active sickle cell anemia. The bone marrow was secured through sternal puncture. The sickling phenomenon of the erythrocytes of the bone marrow was in accord with observations made on the sickle cells in the peripheral circulation. The bone marrow displayed no particular embryonic hyperplasia of the erythropoietic tissue. The myelopoietic tissue showed moderate embryonic hyperplasia associated with apparent maturation arrest of the neutrophilic series. Sickle cells, after being thoroughly washed in physiologic solution of sodium chloride, will assume the round shape and tend to remain so in this solution. They will again resume the sickle shape when replaced in their own serum or in that of a normal person of the same blood type. Normal erythrocytes of the same blood type will not assume the sickle shape in the serum of a patient with sickle cell anemia even after long standing.

New England Journal of Medicine, Boston

217 935 970 (Dec. 9) 1937

- Surgical Treatment of Peptic Ulcer Based on 130 Subtotal Gastrectomies for Peptic Ulcer T. H. Lahey and S. F. Marshall Boston—p. 933
*Chronic Nontuberculous Basal Lung Disease in School Children P. E. Sartwell Boston—p. 941
Spermatogenic Abnormalities W. W. Williams Springfield Mass—p. 946
Benzedrine Sulfate in Treatment of Syncope Due to Hyperactive Carotid Sinus Reflex Report of Two Cases L. J. Robinson Palmer Mass—p. 952
New Technique for Vaccination Against Smallpox H. J. Freedman Boston—p. 953

Chronic Nontuberculous Basal Lung Disease in School Children—Sartwell reports the work of the Chadwick Clinic, organized for the prevention and early diagnosis of tuberculosis in the Massachusetts schools, through which roentgenograms have been taken of more than 100,000 children since the organization of the clinic in 1924. The present study deals with fifty-three basal nontuberculous lesions which have persisted from two to twelve years. These fifty-three patients are believed to have bronchiectasis atelectasis or combinations of the two. The only other condition likely to be confused with these is congenital cystic disease of the lungs which may be represented in a few cases classified as bronchiectasis. Group A consists of twelve children with atelectasis and group B consists of forty-one children believed to have bronchiectasis. There were twelve children (group C) followed for years who had basal lesions heard in nearly all examinations and a history of chronic cough and expectoration but no

definitely abnormal roentgenogram, although most of them show some accentuation of the descending bronchial markings. They are included for comparison with the foregoing groups. Etiologic factors were difficult to define. Pertussis and pneumonia were the only diseases described in more than one instance as marking the onset of cough. In some of the patients enlarged nodes resulting from tuberculosis, bronchopneumonia or pertussis may have constricted the bronchi long enough to leave permanent lesions, without themselves remaining roentgenologically demonstrable. However, there is no proof of this. The study gives no clue as to the causative agent in most cases. In groups A and B there was often a history of chronic cough and expectoration or of frequent chest colds, sometimes there had been repeated attacks of what was termed "pneumonia", coarse crepitant rales might be heard at one or both bases, or sometimes throughout the lungs, often being more widespread than the disease as indicated roentgenologically. An attempt has been made to evaluate the outcome of these cases on the basis of x-ray changes alone, hence those with negative films are considered as unchanged. The most striking finding was that the outcome was decidedly better in group A than in group B. No case of atelectasis showed progression, while two were considered as recovered and six as improved. In contrast, eight children in group B showed an increase of lesions and two died. Rapid evolution, as is common with pulmonary tuberculosis in this age group, was not observed. In several cases of atelectasis the shadow became larger and less dense, indicating partial expansion, in one it disappeared, leaving only a few linear markings in the cardiophrenic angle. Of the forty-one children in group B, twenty-nine had been under observation for three years and more of these, one recovered, five improved, seventeen remained unchanged, five progressed and one died. There were two deaths in the group of forty-one, neither of which can be proved to be due to the chronic process, however, both children had pneumonia and it is likely that bronchiectasis was at least a predisposing factor. The children in group C seemed to do well while under the supervision of the clinic. Some of them may have simply had recurrent bronchitis, others may present cases of bronchiectasis.

New Orleans Medical and Surgical Journal

90 315 386 (Dec) 1937

- Eye Findings as an Aid in Diagnosing and Localization of Brain Tumors L W Gorton Shreveport La—p 315
Role of the Neurologist in Brain Tumor L R Young Covington La—p 318
Surgical Treatment of Brain Tumors E Sachs St Louis—p 322
Correlation Between Increase in Longevity and Higher Death Rate of Degenerative Diseases in New Orleans A E Fossier New Orleans—p 325
Some Common Conditions Affecting the Heart M W Hunter Monroe La—p 334
Modern Trends in Diagnosis and Treatment of Syphilis A B Cannon New York—p 338
Radiation Therapy in Benign Uterine Hemorrhage H G F Edwards Shreveport La—p 346
Roentgen Rays and Their Use in Treatment of Skin Diseases M T Van Studdiford New Orleans—p 349
Acute Pancreatitis W H Cole Chicago—p 351
Phytobezoar of Stomach Associated with Gastric Ulcer C P Ruledge Shreveport La—p 357

New York State Journal of Medicine, New York

37 2065 2146 (Dec 15) 1937

- Cancer of Rectum and Rectosigmoid Notes on Surgical Treatment F W Rankin Lexington Ky—p 2065
Relief of Pain by Physical Measures R Kovacs New York—p 2070
Pneumonia in New Born and Stillborn Infants Margaret Warwick Buffalo—p 2075
Clinical Observations on Tonsillectomized Cases A A Cinnelli New York—p 2079
Clinical Electromyography Preliminary Study of Normal and Ischemic Muscles B Jablons and P Reichert New York—p 2082
Human Female Sterility Etiologic Factors C P Seldon Albany—p 2089
Esophageal Perforations Report of Two Fatal Cases J W Miller New York—p 2093
Primary Melanoblastosis of Meninges I Shapiro and E Kellert Schenectady—p 2096

Relief of Pain by Physical Measures—Kovacs states that physical agents are available almost anywhere, their dosage can be controlled fairly accurately, they can be usually applied directly to the seat of the disorder, there is no danger of habit forming and there is little likelihood of untoward

effects due to idiosyncrasy. Every physical agent when applied to the body exerts a physical action and this in turn brings about secondary physiologic and clinical effects. Clinical experience is needed for selection of the various measures and their combination with other forms of treatment.

Northwest Medicine, Seattle

36 415 454 (Dec) 1937

- Eczema F W Lynch St Paul—p 415
Streptococcus Haemolyticus F R Maddison Tacoma Wash—p 418
Bloody Complications of Obstetrics N F Miller Ann Arbor Mich—p 422
Faulty Rotation of the Intestines M S Rosenblatt Portland Ore—p 425
Drainage of Abdominal Cavity M A Howard Portland Ore—p 428
Surgical Lesions of the Kidney Requiring Nephrectomy J R Hand Portland Ore—p 430
Public Health Aspects of Rabies Control A Weinzierl Portland Ore—p 432

Ohio State Medical Journal, Columbus

33 1293 1404 (Dec) 1937

- Some Practical Considerations of Conditions in Otolaryngology of Interest and Importance to the General Practitioner W B Chamberlin Cleveland—p 1309
The Improper Nose Blowing Habit W H Craddock Cincinnati—p 1314
The Central Nervous System and Diabetes Mellitus A R Vondrahe Cincinnati—p 1315
Treatment of Acute Alcoholism P Piker Cincinnati—p 1318
Severe Hemolytic Streptococcal Meningitis with Recovery After Use of Protosil and Sulfanilamide M D Friedman and L Lieberman Cleveland—p 1322
Control of Temperature in External Auditory Canal with Prevention of Otitis Media E R Hargett Washington D C—p 1324
Breast Tumors H B Davidson Columbus—p 1326
Allergic Manifestations at the Holiday Time W F Mitchell Columbus—p 1328

Treatment of Acute Alcoholism—Piker maintains that two cardinal points of attack exist in the treatment of acute alcoholism. They are the stopping of further absorption of alcohol into the blood stream (which involves cessation of drinking and removal of any alcohol remaining in the stomach) and the increasing of circulatory and respiratory efficiency so as to hasten the elimination of alcohol and other existing toxic substances from the tissues, which is best accomplished by caffeine. Lavage and caffeine, then, provide the core of the therapy of acute alcoholism. Oral magnesium sulfate, alkalis and fluids are indicated in all cases. For the various more difficult complications, intravenous hypertonic sucrose or dextrose, spinal fluid drainage, paraldehyde, carbon dioxide and oxygen inhalation, heat and apomorphine may be utilized according to the needs in the specific case, but with the use of apomorphine the cardiac condition should be known, as death from heart failure may be the result. Therapy in acute alcoholism, as in all other pathologic conditions, should seek to be rational whenever possible and should not be distorted by the physician's desire to appear spectacular or to relieve himself as quickly as possible of a cumbersome patient.

Psychoanalytic Quarterly, Albany, N Y

6 383 574 (Oct) 1937

- The Fantasy of Dirt L S Kubie New York—p 388
Attempt at an Experimental Investigation of Psychoanalytic Therapy T V Kovsharova Moscow U S S R—p 426
Giovanni Segantini Psychoanalytic Essay K Abraham—p 453
Experimental Demonstration of Unconscious Mentation by Automatic Writing M H Erickson Eloise Mich—p 513
Childhood Anxiety W G Barrett Boston—p 530

Review of Gastroenterology, New York

4 267 342 (Dec) 1937

- Problems in Surgical Treatment of Biliary Disease W W Babcock Philadelphia—p 267
Gastric Evacuation of Fats with Especial Reference to Pyloric Sphincter Activity J P Quigley and I Meschan Cleveland—p 272
Carbohydrate Indigestion Associated with Biliary Tract Pathology S Rey and N Rilla Buenos Aires Argentina—p 276
Esophageal Carcinomas H G Bullwinkel New York—p 285
Cancer of Colon with Some Observations on Early Diagnosis C F Blake Baltimore—p 286
Gallbladder Disease Medical versus Surgical Treatment Follow Up Study H L Segal Rochester N Y—p 292
Benign Tumors of Stomach Report of Case of Leiomyoma W W Mott White Plains N Y—p 297
Gastrojejunocolic Fistula F J Lust New York—p 300
Antispasmodic Therapy in Gastro-Intestinal and Biliary Tract Disease H I Goldstein Camden N J—p 305

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

49 527 586 (Dec.) 1937

- Richard Mead. His Contribution to Scabies. R. Friedman—p. 527
Investigation of Virus Diseases of Skin. Report of Case of Kaposi's Varicelliform Eruption. R. T. Brain and Beatrice Lewis—p. 551
Pyoderma Gangrenosa. R. Gibson—p. 560

British Journal of Ophthalmology, London

21 625 672 (Dec.) 1937

- Exfoliation of Superficial Layer of Lens Capsule (Vogt) and Its Relation to Glaucoma Simplex. E. Horven—p. 625
Early Ophthalmologists in Calcutta. E. O. G. Karwan—p. 638
Retinoblastoma. T. H. Brown—p. 645
Tarsitis Syphilitica. M. Khalil—p. 648
Treatment of Herpetic Keratitis with Vitamin B. J. Nitzulescu and Ecaterina Triandaf—p. 654
Stereoscopic Cards in Color for Children. Series B. C. Berens—p. 659
Chart for Testing Visual Acuity of Amblyopic Children and Adults. C. Berens—p. 661

British Medical Journal, London

2 1103 1152 (Dec. 4) 1937

- Early Diagnosis of Pulmonary Tuberculosis. G. Marshall—p. 1103
Treatment of Acquired Defects of the Skull. J. H. Pringle—p. 1105
Some Unusual Cases of Glaucoma Secondary to Injury. R. A. Greeves—p. 1107
Benzedrine in Seasickness. J. Hill—p. 1109
Critical Survey of 349 Cases of Breech Delivery. C. H. G. Macafee and H. J. McClure—p. 1112
Requirements of Sodium Chloride. M. A. Falconer and A. Lyall—p. 1116
Serum Treatment of Typhoid Fever. C. J. McSweeney—p. 1118

Use of Benzedrine Sulfate in Seasickness.—Hill examined 100 cases of seasickness. Except as conditions of hypertension, cardiac disease and unusual degrees of excitability contraindicate the use of benzedrine sulfate, these cases were taken consecutively as they presented themselves. The group comprised eighty-two women and eighteen men. Their average ages were 36.6 and 33.2 respectively. Satisfactory results were obtained in thirty-nine cases, in all of which the improvement was unequivocal, every likely fallacy having been carefully excluded. Those responding to benzedrine alone showed a mean pulse rate of 69 recumbent, increasing by 18 per cent on sitting up, in the group of failures the corresponding figures were 77 and 11 per cent, that is to say, a tendency to vagotonia predominated in the first group. It is doubtless in the vagotonic variety of seasickness that benzedrine finds its greatest usefulness. In its mode of onset this sickness reproduces in slow motion the prologue to an attack of syncope. The clinical signs point to a disturbance of the stabilizing control of the circulation whereby the effects of low arterial pressure are neutralized by tachycardia, and vice versa. Doubtful cases numbered forty. This group comprised not only those of whom it was doubtful whether they had improved but also those concerning whom there was any room for doubt as to how improvement had been brought about. Psychologic factors were reckoned with. Analysis of the twenty-one cases which failed to respond to benzedrine shows that most cases of seasickness are amphotonic. In some cases of extreme vagotonia the dosage (usually from 10 to 20 mg.) was apparently not adequate, insufficient attention was paid to the influence of constipation. A study of the data provided here described yields two generalizations regarding the action of benzedrine. 1. When euphoria has resulted, the subsequent depression is insignificant in degree and duration compared with the preceding exaltation, probably the reaction coincides with the period of sleep. 2. The effects appear rapidly but are long continued, as if a succession of interdependent physiologic changes had been initiated by the action of the drug. The rapid effect on gastric spasm, suggesting a local action, is obviously of great value in seasickness. It is remarkable how seldom benzedrine is vomited, even by patients who have openly despaired of being able to retain it. Enthusiasm for a new drug must be tempered with sound skepticism and the results scrutinized with care. For the suppression of sympathetic activity, especially that associated with dread of seasickness, bromides rank high. Benzedrine sulfate has great possibilities of usefulness in certain cases of seasickness in which there are signs of excessive vagus activity.

East African Medical Journal, Nairobi

14 249 280 (Nov.) 1937

- Direct Injection of Lungs for Treatment of Pulmonary Tuberculosis. J. R. Roberts—p. 251
The Female Kikuyu Pelvis in Relation to Labor. J. C. Carothers—p. 260
Difficulties of an Amateur Cataract Extractor. R. L. Retief—p. 267
Memory and Loss of Memory. S. Ram—p. 268

Lancet, London

2 1291 1352 (Dec. 4) 1937

- *Treatment of 106 Cases of Puerperal Fever by Sulfanilamide (Streptocide). L. Colebrook and A. W. Purdie—p. 1291
Localized Disease of Popliteal Artery. A. M. Boyd—p. 1294
Disability of Workers Using Pneumatic Drills with Especial Reference to Radiologic Changes. J. W. McLaren—p. 1296
Treatment of Tuberculosis by Needle Puncture of the Lung. C. R. Lavalle—p. 1299
Myxedema Heart Disease. Treatment and Radiographic Changes. C. E. Ans—p. 1300
Tomography in Vertical Position. C. Colyer—p. 1302
Supracallosal Epidermoid Cholesteatomas. A. R. D. Pattison—p. 1303
Effect of Testosterone Propionate on Postpuberal Eunuch. G. L. Foss—p. 1307

Treatment of Puerperal Fever by Sulfanilamide.—Colebrook and Purdie treated 106 cases of puerperal sepsis with sulfanilamide—usually by mouth alone. One hundred of the patients were infected by hemolytic streptococci (ninety-two belonging to group A Lancefield), three were infected by anaerobic streptococci and three by staphylococci. The clinical course of the 100 cases infected by hemolytic streptococci has been on the whole similar to that of the sixty-four cases previously treated by sulfamidochrysoidine and prontosil soluble (1936), although resolution of the infective process has seemed less spectacular. The average stay in the hospital has been 19.7 days as compared with 31.3 days in 1935. There were eight deaths among the 100 cases, but only three of them can be regarded as deaths from frank sepsis in patients who lived long enough for chemotherapy to have a fair trial. The mortality rate for all cases (199) infected by hemolytic streptococci since the beginning of 1936 (when treatment by sulfamidochrysoidine and prontosil soluble was begun) has been 5.5 per cent as compared with the average of 22.8 per cent for the preceding five years. Some degree of cyanosis developed in fifty-eight cases and was usually associated with methemoglobinemia and sulfhemoglobinemia. Other toxic manifestations of the drug observed much less frequently have included prostration, paresthesia, headache, visual disturbances and joint pains. No generalized rashes developed.

Tubercle, London

19 97 144 (Dec.) 1937

- Difficulties Encountered in Industry in Dealing with the Tuberculosis Problem. R. E. Lane—p. 97
Artificial Pneumothorax. Bronchial Fistula Recovery. W. S. Gilmour—p. 105
My Chief Difficulties in Dealing with the Tuberculosis Problem. H. D. Cormae—p. 109
Id. W. F. Jackson—p. 114
A Case for Diagnosis. G. Jessel—p. 118
*Reflections on Treatment of Unilateral Pulmonary Tuberculosis. P. J. L. De Bloeme—p. 120
The Levinson Test for Tuberculous Meningitis. S. Hurwitz—p. 127

Treatment of Unilateral Pulmonary Tuberculosis.—De Bloeme investigated the importance of prolonged rest in bed and collapse therapy in the treatment of unilateral pulmonary tuberculosis during a recent period of five years (1931 to 1936). Of the 1,260 cases seen in the sanatorium during this period 279 presented unilateral tuberculosis, 113 with negative or absent and 166 with positive sputum. About 75 per cent of the patients with unilateral involvement admitted with positive sputum lost their bacilli. To accomplish this, collapse therapy was resorted to in 60.5 per cent, while 39.5 per cent needed no additional treatment. Phrenic evulsion gave as good results as artificial pneumothorax. No unilateral case with positive sputum should be treated at home, as collapse therapy is too frequently indicated. When the distinction is made between the cavity case and the noncavity case, the need is still more urgent. As long as no cavities are present expectant treatment can be applied, but as soon as cavities are present, particularly on the left side, collapse therapy will be necessary in the majority of cases if conversion of the sputum is to be achieved.

Presse Medicale, Paris

45 1819 1850 (Dec 18) 1937

- Aspecific Premunition of Microbic Enteropathies G Sanarelli—p 1819
Little Known Type of Chronic Colitis Chronic Metadysentery A Castellani—p 1823
Humoral Treatment of Malarial Infection M Ascoli—p 1827
Accretion Without Concretion Study on Pathogenesis of Adhesive Pericarditis and of Active Venous Hypertension L Condorelli—p 1831
Behavior of Proteins and of Several Azotized Fractions of Blood in Course of Hemoclastic Reaction L D'Amato and M Zappacosta—p 1835
Remarks on Technique of Gastroduodenal Resection M Donati—p 1838
Intertrochanteric Osteotomy in Treatment of Pseudarthroses of Neck of Femur V Putti—p 1841

Treatment of Malaria—Ascoli says that fever and hypertrophy of the spleen, the most prominent symptoms of malaria, develop with the disease and disappear as it is cured. The author decided to try the administration of epinephrine, which is known to produce a splenic contraction. He resorted to intravenous injections daily. The doses are gradually increased, at first a concentration of 1:100,000 is given, then 1:90,000, then 1:20,000 and 1:10,000. The last mentioned dose is repeated generally about twenty times. Contraindications to this treatment are cardiac defects and circulatory disorders in general (hypertension, exophthalmic goiter, myocardiac insufficiency and so on). The treatment is especially well tolerated by children, who are benefited more rapidly than adults. If in all not more than from 2 to 4 mg of epinephrine is administered, the febrile attacks cease, the hypertrophy of the spleen is reduced completely or partially and the splenic pains subside, the condition of the blood is considerably improved, there is an increase in weight and an improvement in the general condition, and Henry's reaction becomes negative.

Gastroduodenal Resection—Donati describes his technique of gastroduodenal resection, which he employed with success in a large number of cases of cancer of the stomach and of gastric and duodenal ulcer. The operation is reliable, simple and rapid. His technique differs from the methods generally employed by the manner in which the duodenal stump is treated and by the type of gastroduodenal suture. He exteriorizes only those viscera on which the surgeon has to work and does not introduce compresses into the abdomen, thereby reducing to a minimum the danger of postoperative adhesions. He protects by compresses only the edges of the laparotomy wound. He does not employ gastroduodenal anastomosis according to the first method of Billroth but prefers gastrojejunal anastomosis. The excision of the great omentum after colo-omental detachment is necessary only in case of resection for cancer.

Ann. di Radiologia e Fisica Medica, Bologna

11 289 372 (Aug) 1937

- Röntgen Researches on Development and Ossification of Thorax During Intra-Uterine Life R Jonata—p 289
Roentgenogram of Obstetric Trauma of Upper Limb A Mastromarino—p 306
Value of Roentgen Examinations in Differential Diagnosis of Malignant and Benign Ulcers of Stomach S Zanetti—p 317
Rhythm of Evacuation of Gallbladder R Rossoni and C Colosimo—p 341
Value of Direct Roentgen Examination in Certain Forms and Stages of Renal Tuberculosis I Bighiardi—p 351

Development of Thorax During Intra-Uterine Life—Jonata carried on roentgen studies of the developing thorax of the fetus. He found that the nuclei of ossification of the third, fourth, fifth, sixth and seventh ribs are visible in the roentgenograms after the fiftieth day of intra-uterine life, those of all the ribs, except the last two, appear at the end of the second month and those of the eleventh and twelfth ribs appear, respectively, at the first and second fortnight of the third month. The curve of the torsion of the ribs appears in the course of the fourth month. The author found that the thorax of the fetus does not have a constant form in the different periods of its development. It goes through morphologic changes from the third month to the complete term of intra-uterine life, all through which the transverse diameters are longer than the anteroposterior ones. The thorax is wider and shorter during the first few months of intra-uterine life than it is in fetuses at full term. It is not flat at the sides. It looks narrower at the upper two thirds than at the base, owing to the amplification of the base which takes place during the last three months of

intra-uterine life. The upper circumference of the thorax of fetuses, from the fourth month of intra-uterine life on, shows as a heart on playing cards, such as in roentgenograms of the thorax of adults. The transverse diameter of the upper circumference of the thorax is longer than the anteroposterior one. The pulmonary grooves are visible from the fourth month and accentuate themselves during the last half of intra-uterine life. The topographical relations between the ribs and the vertebral column of fetuses and adults are similar.

Zentralblatt für Gynäkologie, Leipzig

61 2845 2892 (Dec 11) 1937

- Development of Distal Part of Vagina and of Hymen in Human Beings R Meyer—p 2846
Inhibiting Factor of Corpus Luteum Hormone in Genesis of Epithelial Metaplasias G Effkemann and L Herold—p 2865
Diagnosis of Dysmenorrhea P Singer—p 2870
Epiphyseolysis of Distal End of Humerus as Rare Birth Injury Case W Obadalek—p 2873
Experiences with Sulfanilamide in Obstetrics and Gynecology C Wallis-check—p 2875

Inhibiting Factor of Corpus Luteum—In view of the inhibiting action of the corpus luteum hormone on the ovarian hormone, Effkemann and Herold decided to investigate to what extent the administration of progesterin will inhibit the metaplasias of pavement epithelium and the irregular proliferation of nests of pavement epithelium on the mucosa of the cervix and corpus uteri, which are elicited by estrogen. Experiments on several groups of rats demonstrated that by the administration of progesterin the epithelial metaplasias in the region of the uterus which are elicited by large doses of estrogen can be made to disappear. In case of the simultaneous administration of estrogen and progesterin, the epithelial metaplasias do not develop.

Sulfanilamide in Obstetrics and Gynecology—Wallis-check says that at the woman's clinic in Karlsruhe sulfanilamide has been used with good success during the last three years in 100 cases of septic disorders. He says that in the mild cases at his clinic two tablets (18 Gm) three times daily proved adequate. In severe cases the intramuscular injection of 5 cc three times a day produced good results. Regarding the indications for the administration of sulfanilamide, the author says that puerperal sepsis takes first place. It was observed that these especially grave cases of puerperal fever responded better to sulfanilamide than those cases in which the vaginal secretion was free from streptococci. Sulfanilamide was found helpful also in the septic conditions after abortion, even in those in which the adnexa had become involved, and in the obscure febrile disorders of the puerperium which are usually caused by a thrombosis or a thrombophlebitis of the pelvic veins.

Wiener klinische Wochenschrift, Vienna

50 1667 1698 (Dec 10) 1937

- Dangers of Air Embolism with Especial Consideration of Thyroidectomy D Guthrie—p 1667
Treatment of Sequels of Poliomyelitis J Hass—p 1670
Change of Electric Charge of Disperse Phase of Organic and Inorganic Dispersoids by Radon E Epstein—p 1673
Dangerous Foreign Bodies E Wessely—p 1674
Problem of Cancer A Windischbauer—p 1676
Dermatomycoses A Matras—p 1680
Myogeloses O Stracker—p 1685

Air Embolism, Particularly in Thyroidectomy—Guthrie, after reviewing the literature on air embolism, reports his own observation. He describes three serious cases and one fatal case of air embolism that were observed at his clinic in the last three years. He points out that, although rare, it may occur in any operation, but particularly in operations on the neck. He thinks that many unexplained fatalities during operations are the result of air embolism. Although the passage of air into the vein may not be heard, air embolism may nevertheless be the cause of death. Even a small quantity of air that enters into the vascular system of a patient with exophthalmic goiter and with toxic impairment of the heart may have a fatal effect. It is dangerous to have too many Kocher's forceps in the surgical field, for they may slip off and thus provide an entry for air. All veins should be ligated as soon as possible. Moreover, the incision should be made with great care so as not to injure the external jugular vein. The branches of this vein must be treated with extreme care, particularly when the

operation is the second one and it is difficult to mobilize the remaining glandular tissue. In three of the reported cases the operation was a second intervention. Because respiratory paralysis precedes the cardiac paralysis in case of collapse resulting from thrombo-embolism, artificial respiration should be resorted to at once. The intracardiac injection of epinephrine is likewise helpful.

50 1699 1730 (Dec. 17) 1937

Estimation and Treatment of Circulatory Disturbances in Light of New Tendencies in Medicine. L. Petschacher—p. 1699

*Observations of Hemogram and Bacilluria in Tuberculous Bacillemia. V. Gorlitzer—p. 1703

Incidence of Congenital Luxation of Hip Joint in Austria. A. Sonnenchein—p. 1706

Cancer Problem. A. Windischbauer—p. 1709

Progress in Therapy of Male Gonorrhea. A. Matras—p. 1714

Hemogram and Bacilluria in Tuberculous Bacillemia.—Gorlitzer points out that the much disputed investigations of Reitter and Lowenstein on the pathogenic significance of tuberculous bacillemia in acute rheumatic polyarthritis have been corroborated by other investigators. Then he reports his own studies. In studying the blood picture he gave especial attention to the relationship between the lymphocytes and neutrophils or, as he expresses it, to the lymphoneutro quotient. He found that as the polyarthritis improves, but particularly as the tuberculous bacillemia and bacilluria disappear, the lymphoneutro quotient shows a noticeable increase. However, in case of relapse of the polyarthritis and particularly at the reappearance of the tuberculous bacillemia, he noticed a considerable decrease in the lymphoneutro quotient. Discussing the bacilluria, he says that it is necessary to differentiate between a positive urinary sediment and a positive urinary culture. Urine the sediment of which contains acid-fast and alcohol-fast colonies does not always yield these bacilli in the culture. The colonies from the urine grow, as a rule, much slower than do those from the blood. In answer to the question as to whether there is an effective treatment for tuberculous bacillemia, the author says that he employs manganic chloride in a solution with a molarity of 0.02. He administered by intravenous injection from 0.6 to 1 cc. of the solution and found that under the influence of this treatment the tuberculous bacillemia and bacilluria disappear and the lymphoneutro quotient increases.

Problemy Tuberkuleza, Moscow

Pp. 1136 (No. 8) 1937. Partial Index.

Primary Tuberculosis of Adults. V. T. Shvaytsar—p. 3

Tuberculous Lymphangitic Sclerosis. V. L. Eynis—p. 22

Pathomorphology of Pulmonary Hilus in Secondary Pulmonary Tuberculosis. A. I. Strukov—p. 29

*Diagnosis of Tuberculosis of the Tracheobronchial Lymph Nodes. I. P. Rubinshteyn—p. 39

Hormone Disturbances and Their Treatment in Pulmonary Tuberculosis. M. P. Borok—p. 54

Tuberculosis of the Tracheobronchial Lymph Nodes.—According to Rubinshteyn, each anatomic subgroup of the tracheobronchial lymph nodes presents its own diagnostic possibilities, depending on its localization. Normal lymph nodes cannot be demonstrated either by the roentgenologic or by any other method. In the presence of pathologic alterations roentgenographic demonstration of the lymph nodes is possible only in so-called tumor forming types. The roentgenographic demonstration of enlarged lymph nodes is most readily accomplished in the case of right-sided tracheobronchial subgroups, less so in the case of the right bronchopulmonary and the left aortic subgroups somewhat better with the lymph nodes of Botallus duct and least in the case of the left bronchopulmonary. The roentgenologic demonstration of infiltration about the pulmonary hilus is readily accomplished and when present, constitutes a definite sign of tuberculous lymph nodes. Auscultation yields the poorest results, as was to be expected from the anatomic structure and the topography of the nodes. Enlargement of the nodes is likewise not susceptible of demonstration by the method of percussion except in the case of the right paratracheal group and only when enlargement assumes a tumor forming type. Percussion alongside the vertebral column and the various signs based on this method did not prove of much value. Compression symptoms of the trachea occur only in young children and then rather infrequently. Painful sensations both subjective and objective are not reliable. The tuberculin test is

of considerable importance in determining the specificity of the infectious process. This, however, is true only of the early and the preschool age. Its diagnostic significance is of less value in adolescents and is of no value in adults. The widening of the shadow of the hilus cannot be accepted as evidence of the presence of tuberculous lymph nodes, because similar shadows are seen in tuberculin negative children in the presence of nonspecific infections. The author concludes that objective demonstration of tuberculous lymph nodes is possible only when the latter are considerably enlarged. Tumor-like nodes are seen principally in children of an early age. The younger the child the greater is the possibility of diagnosing tuberculous lymph nodes. Anatomic alterations in the lymph nodes of the adults are too insignificant and for that reason are not demonstrable by any of the physical methods of examination. In the author's opinion, tuberculous bronchoadenitis of adults is not a frequent clinical entity. The diagnosis is justified in the presence of roentgenologic evidence of enlarged lymph nodes, the presence of extrapulmonary tuberculous lesions, an enlarged hilus shadow, the presence of oval or round shadows in the hilus with salt deposits, and the presence of perifocal infiltrations.

Bibliotek for Læger, Copenhagen

129 377 399 (Nov.) 1937

Circulatory Relations in Varices Examined by Intravenous Injections of Dye. Stoff. H. Haxthausen—p. 377

*Infections with Paratyphoid B Bacilli Fermenting Dextrotartaric Acid. M. Kristensen—p. 390

Infections with Paratyphoid B Bacilli Fermenting Dextrotartaric Acid.—In thirteen cases of the infection Kristensen describes fermentation tests with rhamnose, dulcitol and hexahydrobenzene, which disclosed four sharply defined types of the bacilli. They did not cause a typical paratyphoid but an acute enteritis, often as a complication in grave disorders of different kinds. The source of the infection is unknown in all the cases. The author's impression is that the virulence of the bacilli in question toward man is too weak for them to attack perfectly well persons but when a special predisposition exists they can produce infections which in some cases are quite mild and in other cases may become a contributing cause of death. Widal's reaction proved positive in all cases in which the test was made a suitable time after the start of the infection. According to experiences up to now, the dextrotartaric acid-positive paratyphoid B bacilli strains are alike in that they do not cause clinical paratyphoid but an acute (gastro) enteritis. The various fermentation types of dextrotartaric acid-negative paratyphoid B bacilli all seem to be equally able to cause a typical paratyphoid.

Uppsala Lakareforeningens Förhandlingar, Uppsala

43 1138 (Nov. 30) 1937

Increase in Resistance of Organism to Harmful Factors Through Inter-course of Sexes. E. Agdahl—p. 1

Quantitative Micromorphologic Studies on Adrenals of One Year Old White Mice with Especial Regard to Sexual Differences. H. Carlsson, B. Gustafsson and K. L. Møller—p. 49

Chemical Nature and Clinical Applicability of Heparin. E. Jørgen—p. 83

*Contribution to Knowledge of Primary Malignant Skeletal Tumors of Epitheliomorph Type Together with Remarks on Question of Endothelioma. S. Bursell and N. Gellerstedt—p. 91

Statistical Compilation of Fatal Cases of Pulmonary Embolism from 1922 to 1934 and Cases of Thrombosis in 1934. V. Westberg—p. 101

Skeletal Tumors of Epitheliomorph Type.—Bursell and Gellerstedt state that the microscopic formation of many tumors of recognized mesenchymal genesis may show epithelioid structures, especially in cases of endotheliomas of the connective tissue and certain angiosarcomatous varieties of the same, as well as the so-called synoviomys. They describe a tumor in the calcaneus in a boy, aged 15 years, which is believed to have originated primarily in the posterior part of the heel bone. The histologic diagnosis was difficult and they term it a primary epitheliomorph tumor of hitherto little known structure. The history of the case and the results of roentgen examinations point to new tumors in the skeleton (metastases or primary multiple neoplasm of the same kind), and the assumption that the tumor is malignant is also supported by its partly sarcomatous structure and its bone destroying growth.

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